EL-MOASSER
SERIES

# SCIENCE

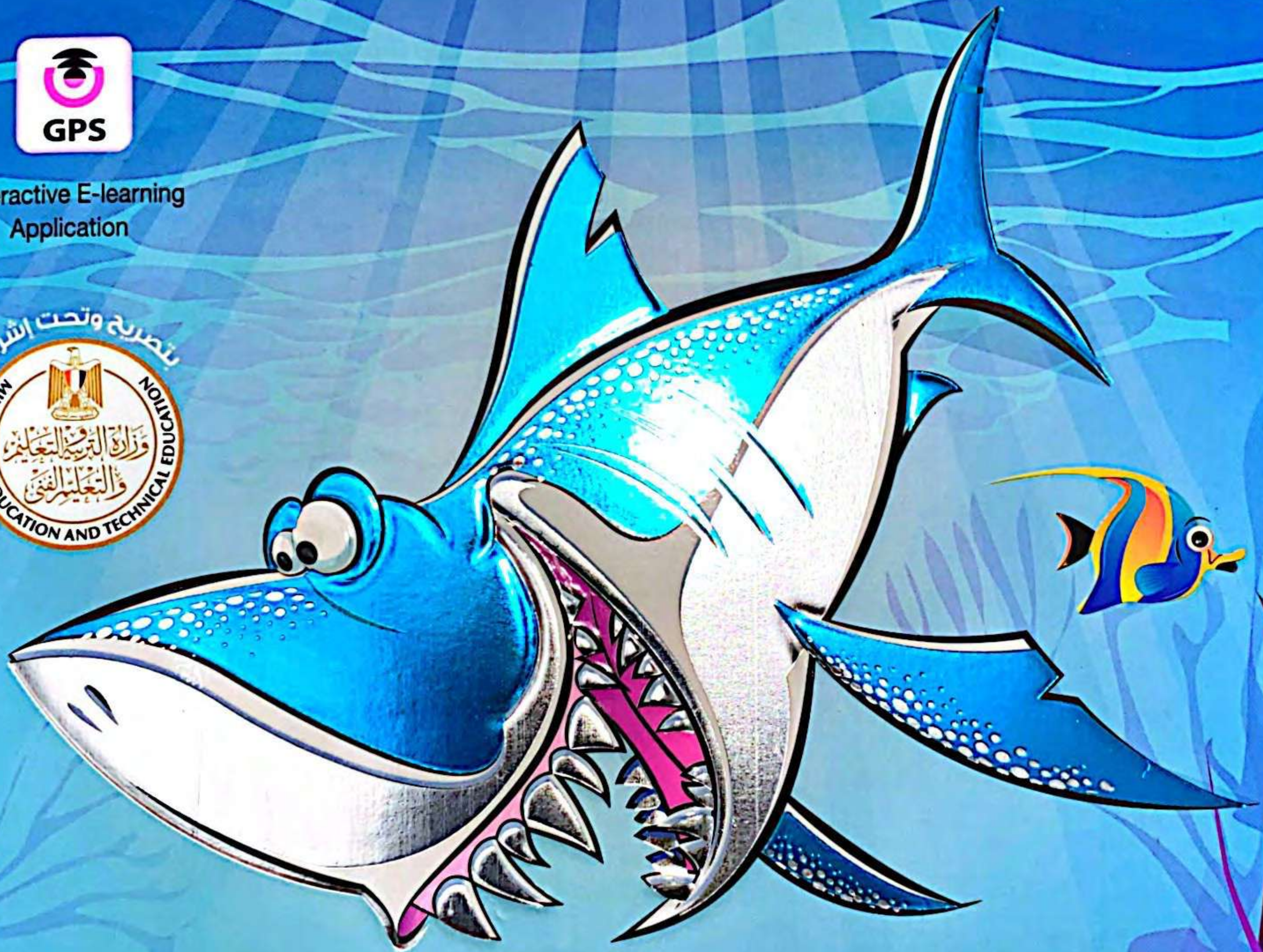
The Main Book

By A Group of Supervisors




Interactive E-learning Application







5th Primary 2024 FIRST TERM

# Contents

THEME ONE : Systems

UNIT ONE : **Interactions of Organisms**



THEME TWO : Matter and Energy

UNIT TWO : **Particles in Motion**

# Get Started



## What I Already Know

- **Plants are found everywhere around us.**
- **There are some basic needs that plants depend on to grow up and survive such as :**

  - Air. - Water. - Sunlight.

- **The opposite pictures show two potted plants :**
  Plant (A) has green leaves and grows well, while plant (B) is wilted and has yellow leaves.



Plant (A)



Plant (B)

- **Plant (B) cannot grow well and die due to one or all of the following reasons :**
  - It may be placed in a dark place, so it doesn't get sunlight.
  - It may not be watered regularly.
  - It may be placed in a bad aerated area, so it doesn't get enough fresh and clean air.

- **In this unit, you are going to study :**
  - How plants use sunlight, air and water to make their own food.
  - Types of living organisms : producers, consumers and decomposers.
  - The interaction between living organisms to get their needed energy through what is called "Food Chains" and "Food Web".

Example : The squirrel eats leaves, fruits, insects and chicks of birds to get the energy it needs.



Squirrel

  - What happens to an ecosystem, if a food chain in this ecosystem is interrupted.

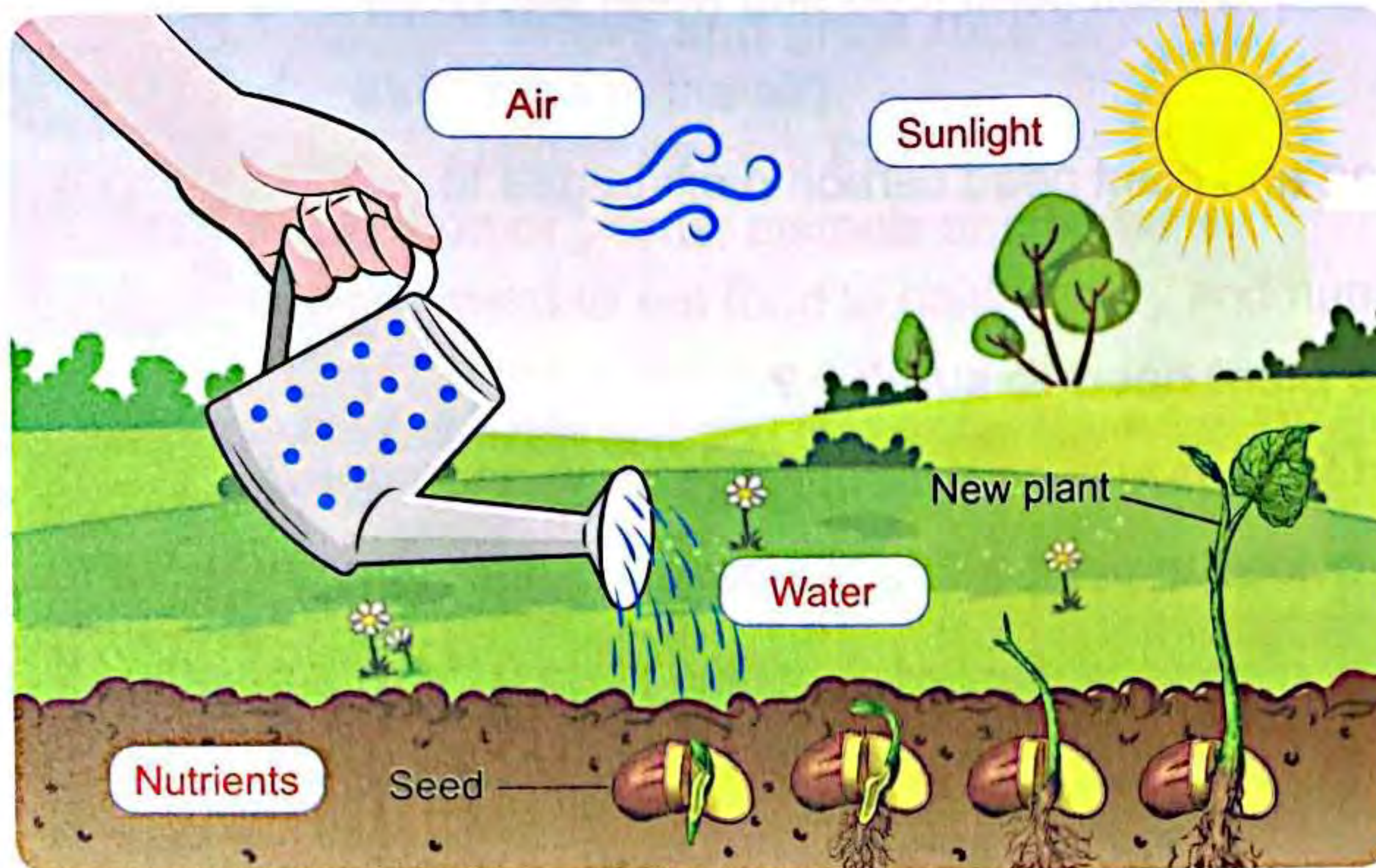
- **Unit Project : "Build a Miniature Ecosystem"**
  At the end of this unit, you are going to build a miniature ecosystem (small ecosystem) to show how living organisms depend on other living organisms to get their food. Also, the importance of some non-living things such as air, water, soil ... etc. for the survival in an ecosystem.



Ecosystem

# LESSON ONE

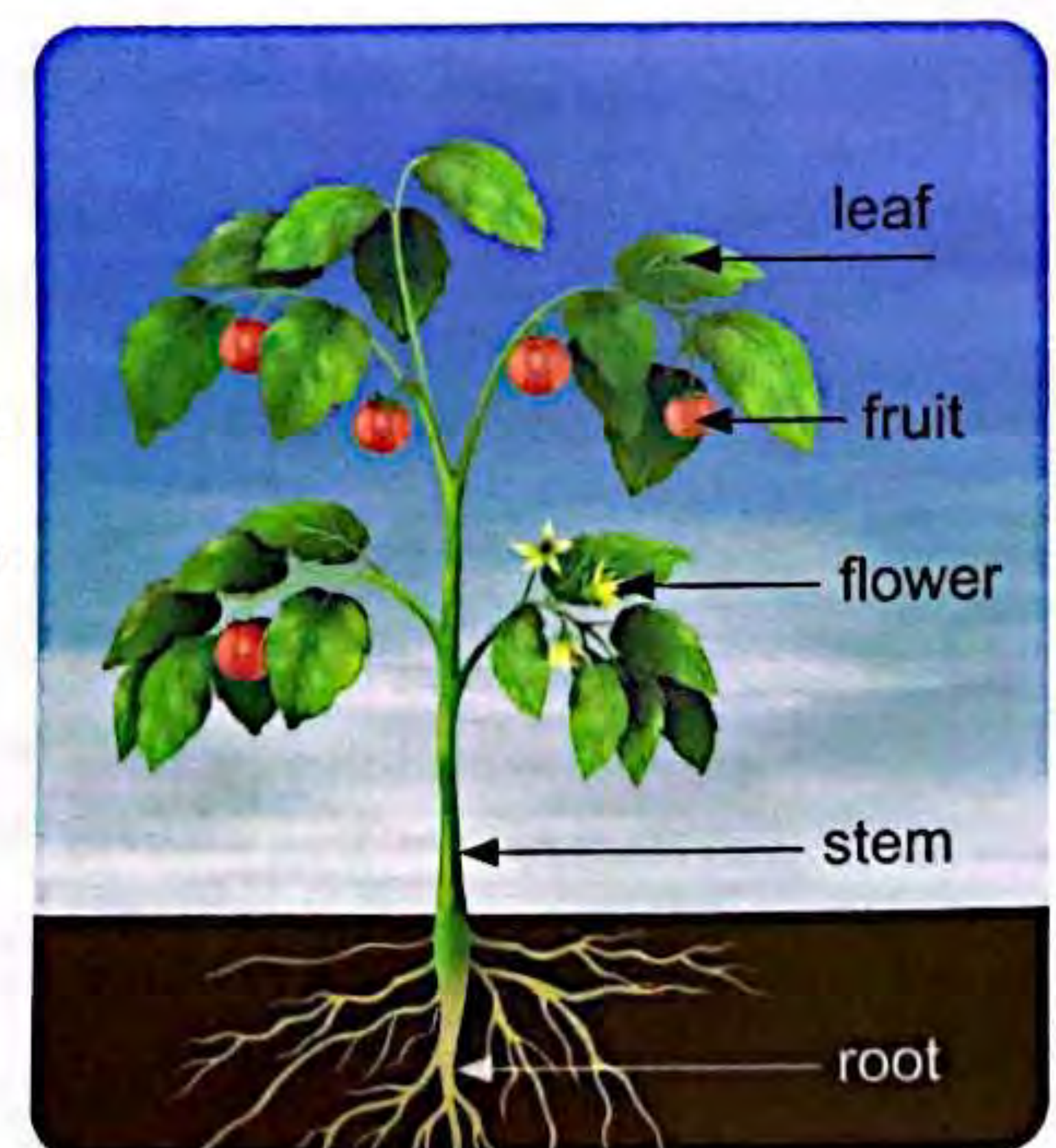
## Activity 1 Can You Explain ?




- When you observe the figure above that shows the steps of growing up a bean seed to form a new plant, you can find out what the plant needs to grow.
- Plants need water, air, sunlight, nutrients and space to grow.

**▸ How do the structures of a plant use water, air and light to perform life processes ?**

- Plants consist of different parts which are roots, stem, leaves and sometimes flowers or fruits, where each part of a plant has its own function.
- Plants use these different parts to obtain their **basic needs** of water, air and light to make their own food.




Plant parts

**▸ In this concept, we will study :**

- Plant basic needs.
- Parts of a plant.
- Comparing plant and human systems.
- Human circulatory system.
- Plant transport system.
- Plant food.
- Flowers and seeds.
- Seed dispersal.

| | | | | | |
|---|---|---|---|---|---|
| bean seed | بذرة فول | space | مساحة | circulatory system | الجهاز الدوري |
| nutrients | العناصر الغذائية | obtain | يحصل على | transport system | نظام النقل |
| perform | يقوم | basic needs | احتياجات أساسية | dispersal | نثر / انتشار |

## Activity 2 Tree Needs

▶ **Look at the opposite picture, then put (✓) or (×) :**



1. Both human and plant need food and water everyday to survive. ( )
2. Both human and plant need carbon dioxide gas to breathe. ( )

▶ **What does a plant need to survive ?**

- Plants need food as well as our bodies to grow and survive.
- We must provide the plant with all its needs to able to grow.

Example : When a tree is planted, it begins to grow from a seedling into a mature tree depending on some resources such as water, air and sunlight to make its food to survive.



### Check your understanding

▶ **Circle the items that the plant needs to grow and survive :**


Space




Water


Meat


Sunlight


Air


Perfume

| | | | | | |
|---|---|---|---|---|---|
| human | الإنسان | plant | يزرع | resources | مصادر |
| seedling | شتلة | mature | ناضج / كبير | | |

## Activity 3

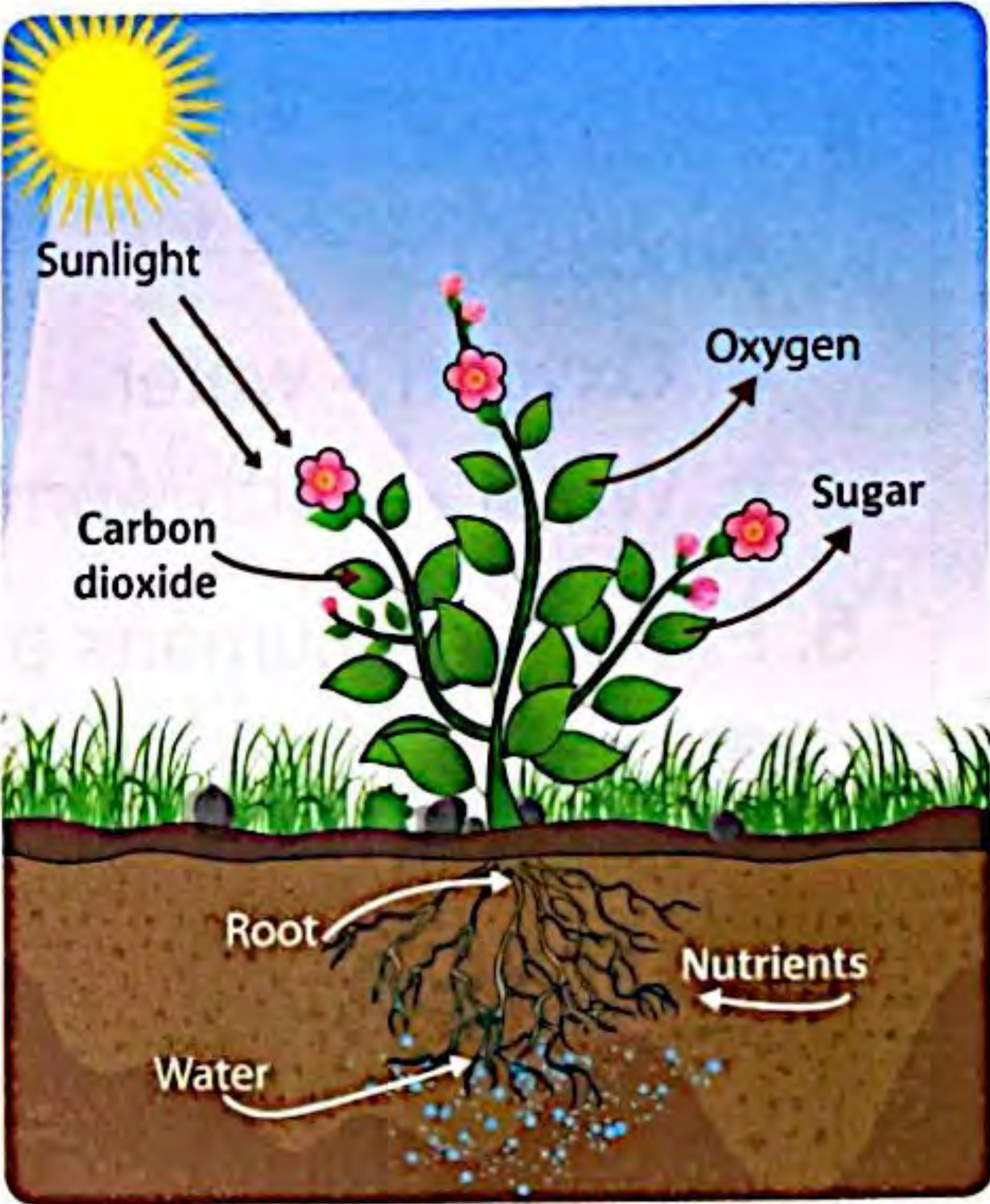
# What Do You Already Know About Plant Needs ?

### Plants and animals

- **Plants need some resources to live and grow such as :**
  - Carbon dioxide gas (a gas found in the air).
  - Sunlight. - Water. - Nutrients from the soil.
- Water and air are basic needs of plants, animals and humans.
- Humans and other animals need to eat food to gain energy and nutrients to live and grow.
- Most plants get nutrients from the soil and make their own food through a process known as "photosynthesis process" that takes place in the plant leaves.

### Plants and food

- Plants make their own food which is a type of sugar that provides the plant with energy to grow.
- Plants make their food (sugar) in their leaves by means of photosynthesis process, **where :**
  - The roots of a plant absorb water and nutrients from the soil.
  - Water and nutrients are carried from the roots to the leaves through the stem.
- **From the previous explanation, we can conclude that the plant's basic needs that enable it to make its food are :**
  - Sunlight - Water - Air (carbon dioxide).



Photosynthesis process



### Check your understanding

▶ **Classify the following items into "Basic plant need for photosynthesis" or "Not basic plant need for photosynthesis" :**

**(Water – Sunlight – Oxygen – Sugar – A forest – Carbon dioxide)**

| Basic plant need for photosynthesis | Not basic plant need for photosynthesis |
|---|---|
| .................................... | .................................... |
| .................................... | .................................... |
| .................................... | .................................... |

**In the Assessment Book :**
**Try to answer :**
Self-Assessment ①

| | | | | | |
|---|---|---|---|---|---|
| basic | أساسى | photosynthesis process | عملية البناء الضوئى | instead of | بدلًا من |
| gain | يكتسب | carbon dioxide gas | غاز ثانى أكسيد الكربون | provide | يمد |
| energy | الطاقة | absorb | يمتص | | |
| by means of | عن طريق | forest | غابة | | |

# Exercises on Lesson 1

Understand    Apply    Higher Thinking Skills

## 1 Choose the correct answer :

1. The ........... of plant absorb water and nutrients from the soil. *(Dakahlia 2023)*
   a. roots    b. stems    c. leaves    d. flowers

2. Humans and other animals need to eat to get ...........
   a. oxygen gas.    b. energy.
   c. carbon dioxide gas.    d. soil.

3. Plants make their food by a process known as ........... *(Alex. 2023)*
   a. respiration.    b. absorption.
   c. photosynthesis.    d. digestion.

4. ........... and ........... are from the plant needs that help it make photosynthesis process. *(Cairo 2023)*
   a. Oxygen – water    b. Sunlight – carbon dioxide
   c. Water – earth worms    d. Nutrients – oxygen

5. Plants and humans are similar in some of their basic needs to survive such as ...........
   a. sunlight and rocks.    b. water and air.
   c. carbon dioxide and soil.    d. soil and water.

6. Plants take .......... from the air to make its food.
   a. water    b. oxygen gas
   c. carbon dioxide gas    d. sugar

7. All the following are plant basic needs to make its own food, except ........
   a. water.    b. air.    c. sunlight.    d. rocks.

8. Which of the following sentences is wrong ? ...........
   a. Plants need sunlight to grow.
   b. Plant roots absorb water from the soil.
   c. Plants make their own food by respiration process.
   d. Plants make their own food in their leaves.

9. Water and nutrients are carried from the roots to the leaves through the ...........
   a. stem.    b. soil.    c. fruits.    d. flowers.

10. In photosynthesis process, plant produces ........... to get energy.
    a. oxygen gas    b. sugar
    c. carbon dioxide    d. water

## 2 Put (✓) or (✗) :

1. Plants need water and air only to grow. *(Menofia 2023)* ( )
2. Stem of the plant absorbs water from the soil. ( )
3. Human, animals and plants need food and water to survive. ( )
4. Plants use the energy of the sunlight to make their own food. ( )
5. Carbon dioxide gas is one of the plant needs that helps it to grow and survive. ( )
6. Photosynthesis process takes place in the plant roots. ( )
7. The plant can make its own food in the absence of water. ( )

## 3 Complete the following sentences :

1. Plants consist of stem, .................. and ..................
2. Plants absorb .................. and .................. from the soil through their ..................
3. Plants make their own food through .................. process that takes place in their ..................
4. The stem carries water and nutrients from the .................. to the .................. of the plant. *(Luxor 2023)*
5. The plants use the light of .................. to make their own food.
6. The food of plant is a type of .................. which is made in their .................. by photosynthesis process.
7. Soil is the source of .................. and nutrients which the plant needs to make its own food.

## 4 Write the scientific term of each of the following :

1. A gas taken from the air by leaves to help the plant to make its own food. (.....................)
2. A liquid substance that plants, animals and human need to survive. (.....................)
3. A part of the plant that carries water and nutrients from the roots to the leaves. *(Cairo 2023)* (.....................)
4. The process by which the plant can make its own food. (.....................)
5. The gas which is released from plants during photosynthesis process. *(Damietta 2023)* (.....................)
6. The source of energy that the plant uses to make photosynthesis process. (.....................)

## 5 Cross out the odd word :

1. Carbon dioxide gas – Water – Oxygen gas – Sunlight. *(Giza 2023)* (......................)
2. Roots – Stems – Leaves – Sunlight. (......................)

## 6 Give reasons for :

1. Roots have important role in photosynthesis process of plants.

.............................................................................................................................

2. Photosynthesis process is important for plants to survive. *(Cairo 2023)*

.............................................................................................................................

## 7 What happens if ...?

1. Plants have no stems.

.............................................................................................................................

2. Plants can't get carbon dioxide gas from air.

.............................................................................................................................

3. We put a green plant in a dark room for many days.

.............................................................................................................................

## 8 Choose from column (B) what suits it in column (A) :

| (A) | (B) |
|---|---|
| 1. Sunlight | a. is absorbed by the roots of the plant. |
| 2. Carbon dioxide | b. is necessary for plant's growth. |
| 3. Water | c. is not a basic need for plant growth. |
| 4. Oxygen | d. a gas which is produced during photosynthesis process. |
| | e. a gas which is used by the plant during photosynthesis process. |

1. .................. 2. .................. 3. .................. 4. ..................

## 9 Adam planted a flowering plant in a pot, He put this plant in a soil rich in nutrients and water it everyday, he used to cover this pot everyday with a carton box to hide it from his brother, after many days, do you think that this plant will survive ? And why ?

a. Yes, because it has nutrients and water.
b. No, because it needs air and light.
c. No, because plant doesn't need water and soil.
d. Yes, because it can survive without sunlight.



# LESSON TWO

## Activity 4 Do Plants Need Soil ?

▶ **Look at the opposite picture, then put (✓) or (×) :**



1. Plants need air and sunlight only to grow. ( )
2. If the plant is not watered for a long time, it will die. ( )

**Do plants need soil to grow ?**

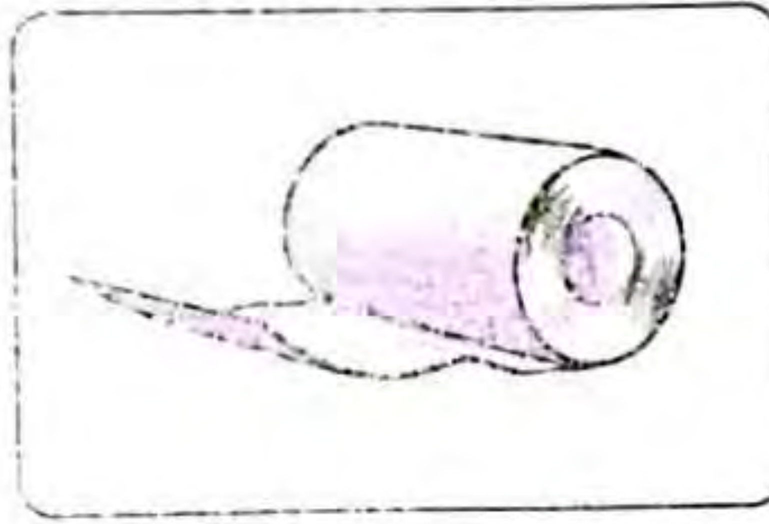
To know whether plants need soil as a basic need for growth or not, we will germinate some seeds in a wet paper towel and measure their growth, and then compare their growth to the growth of the other seeds which are placed in the soil.


**Note**

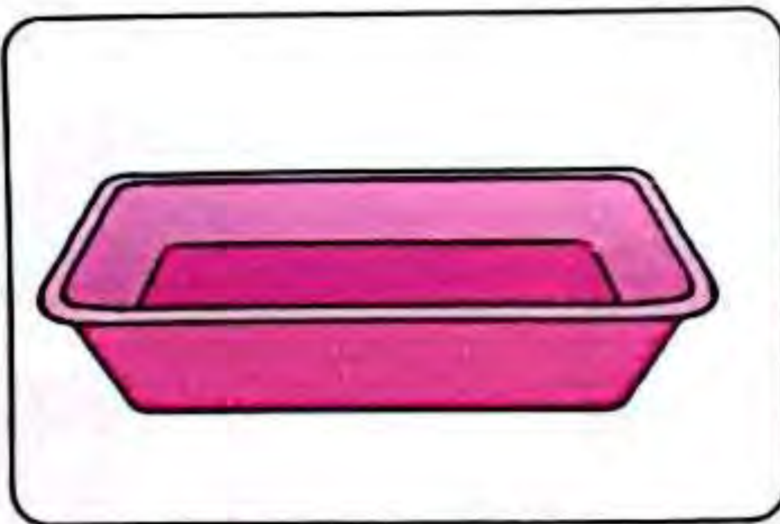
Germination means that the plant sprouts and begins to grow from a seed.

### ▶ Tools

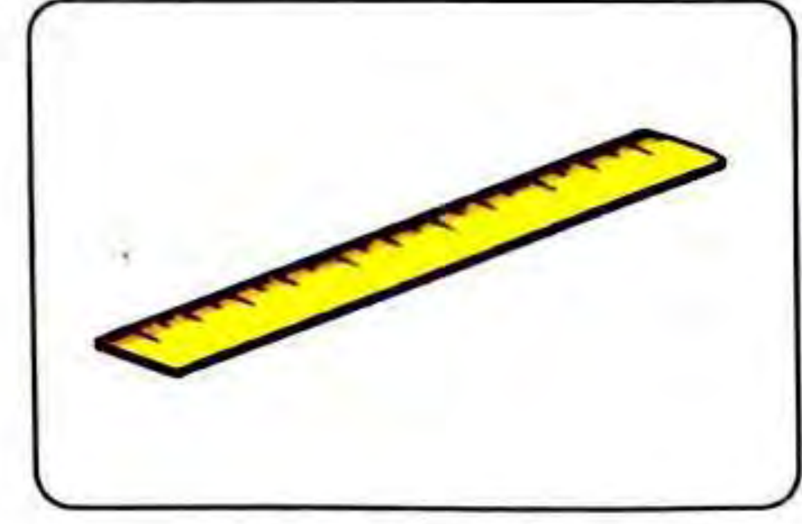

Plastic cup contains soil


Paper towels


Six bean seeds (Fava beans)


Plastic plate


Water


Metric ruler

### ▶ Steps

1. Use the water to wet the paper towel.



| | | | | | |
|---|---|---|---|---|---|
| germination | إنبات | measure | يقيس | fava beans | الفول |
| wet | مبلل | growth | نمو | metric ruler | مسطرة مترية |
| paper towel | منشفة ورقية | sprout | ينبت | | |

2. Place three seeds in the top half of the paper towel and fold the bottom half of the towel up so that it covers the seeds, then place the paper towel inside the plastic plate.



3. Plant the other three seeds in the cup that contains soil, then water the seeds.



4. Place the plate and the cup in a place where they can get sunlight.



5. Check the growth of seeds over the next several days. Wet the paper towel and water the soil as needed.



6. Measure the growth of each seed using the metric ruler.



## Observations

- The initial growth of the seeds placed in the paper towel is similar to that of the seeds planted in the soil.





After 7 days

| | | | |
|---|---|---|---|
| top half | النصف الأعلى | initial | الأولى |
| bottom half | النصف الأسفل | fold | يطوى |

- The seeds grown without soil would not grow as quickly as the seeds in the soil.



After 14 days

## Conclusions

- In the presence of water, seeds can grow (germinate) without soil.
- In the presence of water and sunlight, plants can grow without soil for a while, but finally they need soil.



## Check your understanding

**Put (✓) or (×) :**

1. The presence of soil is necessary for seeds in their initial growth. (     )
2. When bean seeds grown in a wet paper towel, they need soil after a while. (     )

## Activity 5 Sunlight : A Basic Need

- **Plants make their own food through photosynthesis process.**

**Photosynthesis process :**

It is the process through which the green parts of plants (leaves) absorb sunlight to make their own food.

**How can plants make their own food through photosynthesis process ?**

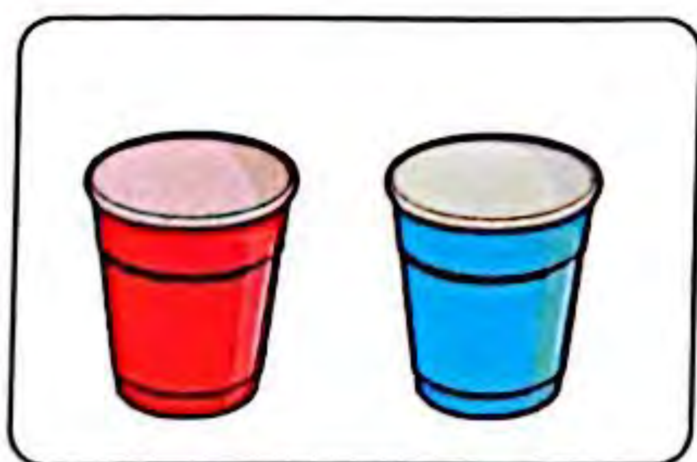
1. Green plants use their leaves to collect sunlight and carbon dioxide from the air.
2. Plant roots absorb water from the soil.
3. Inside the green plants, sunlight allows carbon dioxide to combine with water to produce :
   - **Oxygen** which is released in the air to help living organisms breathe.
   - **Sugar** (the food of plant) which gives the plant the energy it needs to grow.

So, photosynthesis process can be represented as follows :

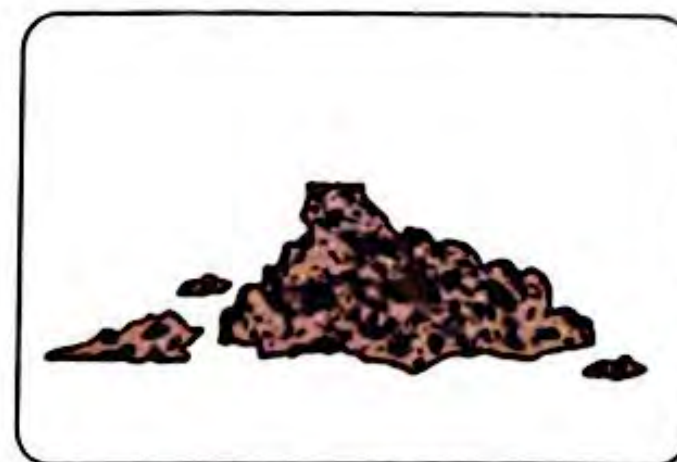
Sunlight + Carbon dioxide + Water ⟶ Oxygen + Sugar

**Now, we will do an experiment to show the effect of sunlight on plant growth :**

### Tools


Two plastic cups


Two bean seeds


Soil


Water

### Steps

1. Add the soil to the two cups, then put the bean seeds on the soil, where each cup contains one seed and cover the seeds with about 2 centimeters of soil.



| | | | | | |
|---|---|---|---|---|---|
| collect | يجمع | effect | تأثير | combine | يندمج |
| release | يُطلق | breathe | يتنفس | | |



2. Add the same amount of water to each cup to moisten the soil.

3. Put the red cup facing the sunlight and the blue cup in a dark place.

4. Water both plants regularly and observe them along two weeks.

## Observations

**After two weeks, we observe that :**

- The plant in the red cup grew taller than the plant in the blue cup.
- The plant in the red cup has four leaves with dark green color, while the plant in the blue cup has two small leaves with pale green color.

## Conclusions

- **Sunlight** is a basic need for the plants like water and air.
- **Sunlight** is important to plant growth, because plants use sunlight to make their own food, so the plant without sunlight does not grow well because it had less food.



## Check your understanding

**In the Assessment Book :**
**Try to answer :**
Self-Assessment (2)

### Put (✓) or (✗) :

1. In the absence of sunlight, plants can make their own food. (   )
2. When a plant grew in sunlight, its leaves become pale green. (   )

| | | | | | |
|---|---|---|---|---|---|
| moisten | يبلل | water | يسقى | pale | باهت |
| regularly | بإنتظام | absence | غياب | | |

# Exercises on Lesson 2

Understand  Apply  Higher Thinking Skills

## 1 Choose the correct answer :

1. When the plant seed begins to grow and makes sprouts, this process is called ...........
   a. respiration.  b. germination.  c. absorption.  d. reproduction.
2. If we put a bean seed in a ..........., it may germinate.
   a. dry paper towel  b. wet paper towel
   c. plastic plate  d. dry soil
3. In the presence of water, seeds can germinate at the beginning of growth without the need of ...........
   a. soil.  b. rocks.  c. insects.  d. dry paper towel.
4. Sunlight and carbon dioxide gas are collected by plant's ........... to make its own food.
   a. roots  b. stems  c. leaves  d. flowers
5. The plant produces ........... through photosynthesis process that gives it the needed energy to grow. *(Cairo 2023)*
   a. oxygen gas  b. water
   c. carbon dioxide gas  d. sugar
6. Without ..........., the plants can't grow well. *(Suez 2023)*
   a. insects  b. rocks  c. sunlight  d. moonlight
7. The roots of a plant absorb ........... from the soil to help it grow.
   a. oxygen gas  b. carbon dioxide gas
   c. sugar  d. water

## 2 Put (✓) or (✗) :

1. At the beginning of germinating some bean seeds, they can grow without soil and water. (   )
2. All seeds need soil in its initial growth. (   )
3. After many days, the growth of plant's seeds in a pot containing soil is similar to the growth of plant's seeds in a wet paper towel. (   )
4. Green plants can grow in a dark room. *(Giza 2023)* (   )
5. Leaves of plants collect sunlight and carbon dioxide gas from air. (   )
6. When the plant makes photosynthesis process, its leaves become weak and yellow. (   )

7. Water and carbon dioxide are absorbed by plant's roots to help the plant to grow. ( )

## 3 Correct the underlined words :

1. Respiration process helps the plant to make its own food. (....................)
2. Oxygen gas is absorbed by plant's leaves to make photosynthesis process. *(Beni Suef 2023)* (....................)
3. When a plant is placed in sunlight, its leaves become pale green. (....................)
4. Plant's leaves absorb water and nutrients from the soil. (....................)

## 4 Write the scientific term of each of the following :

1. The process by which plants make their own food using the energy of sunlight. *(Aswan 2023)* (....................)
2. Parts of the plant where sunlight allows carbon dioxide to combine with water during photosynthesis process. (....................)
3. A gas produced during photosynthesis process and it is needed for respiration of living organisms. (....................)
4. A substance that is produced from the plant during photosynthesis process and provides it with its needed energy. (....................)

## 5 Complete the following sentences :

1. In photosynthesis process, green plant gets ................ from air to make its own food and produces ................ that helps us to breathe.
2. Inside the green plant, sunlight allows carbon dioxide to combine with ................ that is absorbed from the soil by plant's ................ *(Behira 2023)*
3. The sugar that is produced from photosynthesis process provides the plant with ................ it needs to grow.
4. The presence of ................ , ................ and air is very important for plants to grow.

## 6 Give a reason for :

Green plants can make their own food.

..............................................................................................................................

## 7 What happens if ...?

1. We put a seed of bean in wet soil for many days. *(Giza 2023)*

..............................................................................................................................

2. We put a bean seed in a wet paper towel for more than two months.

.......................................................................................................................

3. A plant is placed in a dark place for many days. *(Cairo 2023)*

.......................................................................................................................

**8 Look at the opposite figure, then choose the correct answer :**



1. This process is called ..................
   ( germination – photosynthesis – respiration )
2. Seeds of plant will need .................. to complete its growth after many days.
   ( soil – water – insects )

**9 Look at the following figures then, complete the following sentences using the words below :**

**( soil – figure Ⓐ – figure Ⓑ )**




Figure Ⓐ




Figure Ⓑ

1. The seeds in .................. grow faster than those in ..................
2. Seeds in figure Ⓑ should be transfered into .................. to complete its growth.

# LESSON THREE

## Activity 6 Parts of A plant

▶ **Put (✓) or (✗) :**

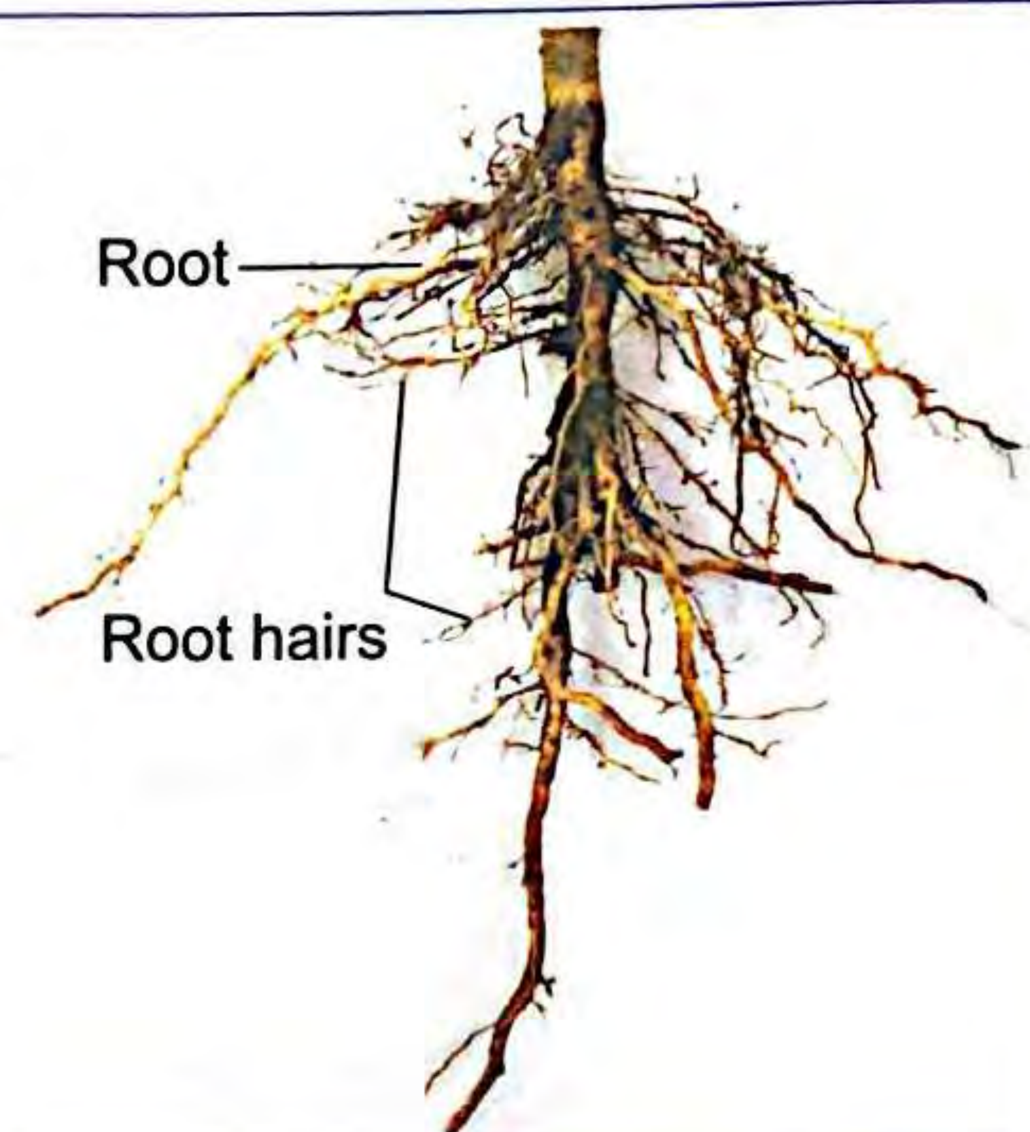
**1.** The main parts of the plants are roots, stems, leaves and soil. (    )

**2.** Each part of the plant has its own function. (    )

**- In this activity, we will study different plant parts in details.**

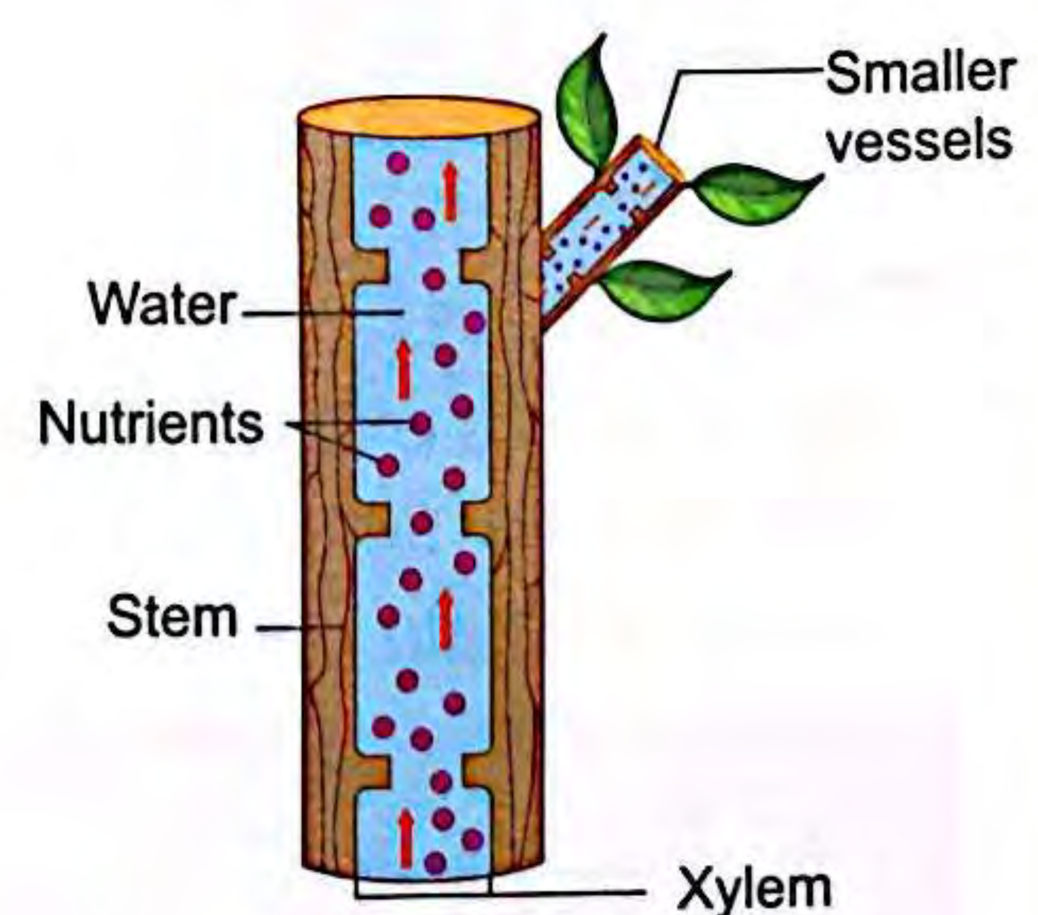
### Roots

- Plant roots have hairlike features (structures) called root hairs that increase the amount of absorbed water and nutrients that the plant needs from the soil.
- **Functions of the plant roots :**
  - Roots fix (anchor) the plant in the soil.
  - Roots absorb (draw) water and nutrients from the soil to the plant.




### Stems

- Water and nutrients move up the plant's stem through tubes or vessels called xylem.
- Smaller vessels of xylem connect the stem to the leaves.
- **Functions of the plant stem :**
  - Stem transports water and nutrients from the roots to the rest of the plant through xylem.
  - Stem supports leaves and flowers of the plant.




| | | | | | |
|---|---|---|---|---|---|
| features | بروزات | root hairs | الشعيرات الجذرية | anchor | يثبت |
| draw | يسحب | absorb | يمتص | increase | يزيد |
| transport | ينقل | support | يدعم | tubes | أنابيب |
| vessels | أوعية | connect | يربط | xylem | نسيج الخشب |

▶ **There are many forms of stems :**

**Forms of stems**

**Wood stem :**
- Some plants have wood stems, such as tree trunks and shrubs.



**Upright stem :**
- Most flowers have upright stems.



**Climb stem :**
- Some plants have climb stems, such as vines (grapes).



**Tuber stem :**
- Some stems extend underground and they are called tubers, such as potato plant.



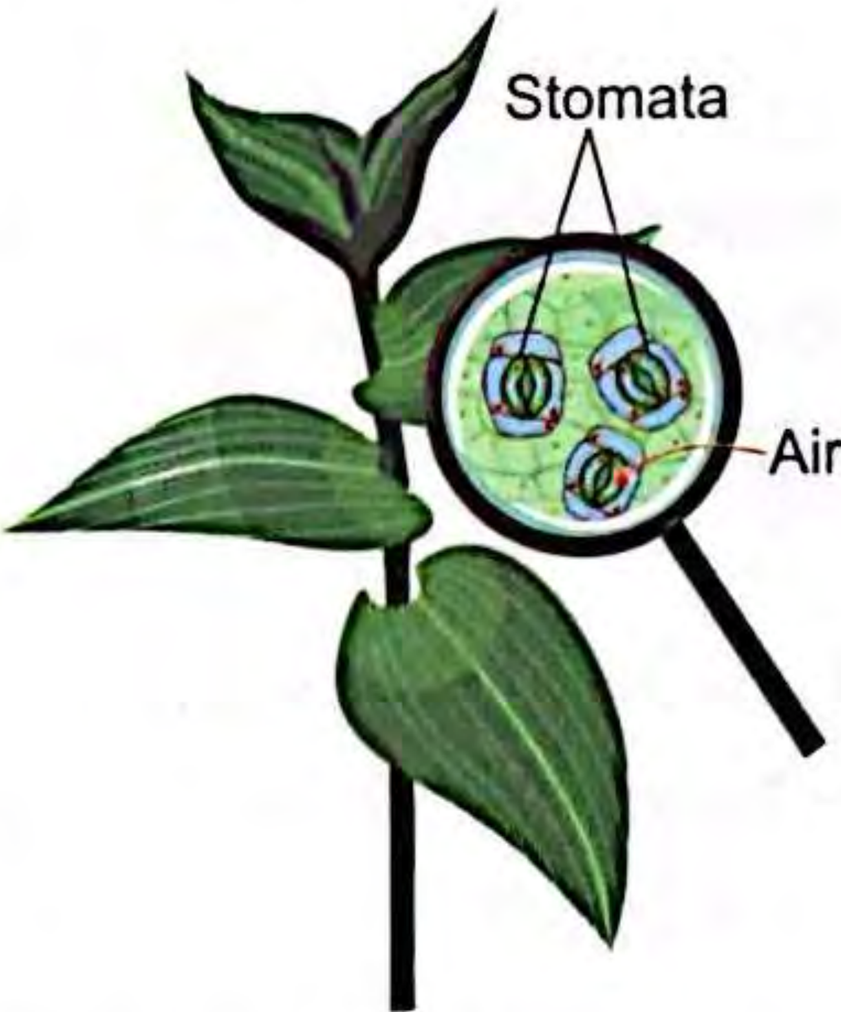
**Runner stem :**
- Some stems run along the ground to help form new plants and they are called runners.



| | | | | | |
|---|---|---|---|---|---|
| wood stem | ساق خشبية | vines / grapes | نبات العنب | underground | تحت الأرض |
| trunk | جذع | shrubs | شجيرات | tubers | الدرنات |
| upright stem | ساق رأسية | extend | يمتد | runners | المدادة / الجارية |
| climb stem | ساق متسلقة | | | | |

## Leaves

- They contain chlorophyll, which gives them their green color.
- Chlorophyll captures (absorbs) energy from the sunlight which allows carbon dioxide to combine with water to make food for the plant.
- The air that plant needs move into the leaves through tiny openings called stomata.




**Stomata :**

They are pores on the surface of plant's leaves that allow gases to move into and out of the plant.

- **Function of the plant leaves :**

Leaves make food for the plant through photosynthesis process.

▶ **There are many kinds of leaves such as :**

Narrow leaves (look like needles) such as pine trees.



Flat and wide leaves.



**Note**

Plant's leaves get their needs of water and nutrients from the soil with the help of :

- Plant's roots.
- Xylem in the plant's stem.
- Smaller vessels of xylem connect the stem to the leaves.

| | | | | | |
|---|---|---|---|---|---|
| capture | يلتقط | pine tree | شجرة الصنوبر | flat | مسطح |
| tiny | صغيرة | stomata | ثغور | surface | سطح |
| openings | فتحات | pores | مسام | wide | عريض |
| narrow | ضيق | needles | الإبر | | |

## Photosynthesis process

▶ **How does photosynthesis process occur in plant leaves ?**

Chlorophyll absorbs energy from sunlight.

↓

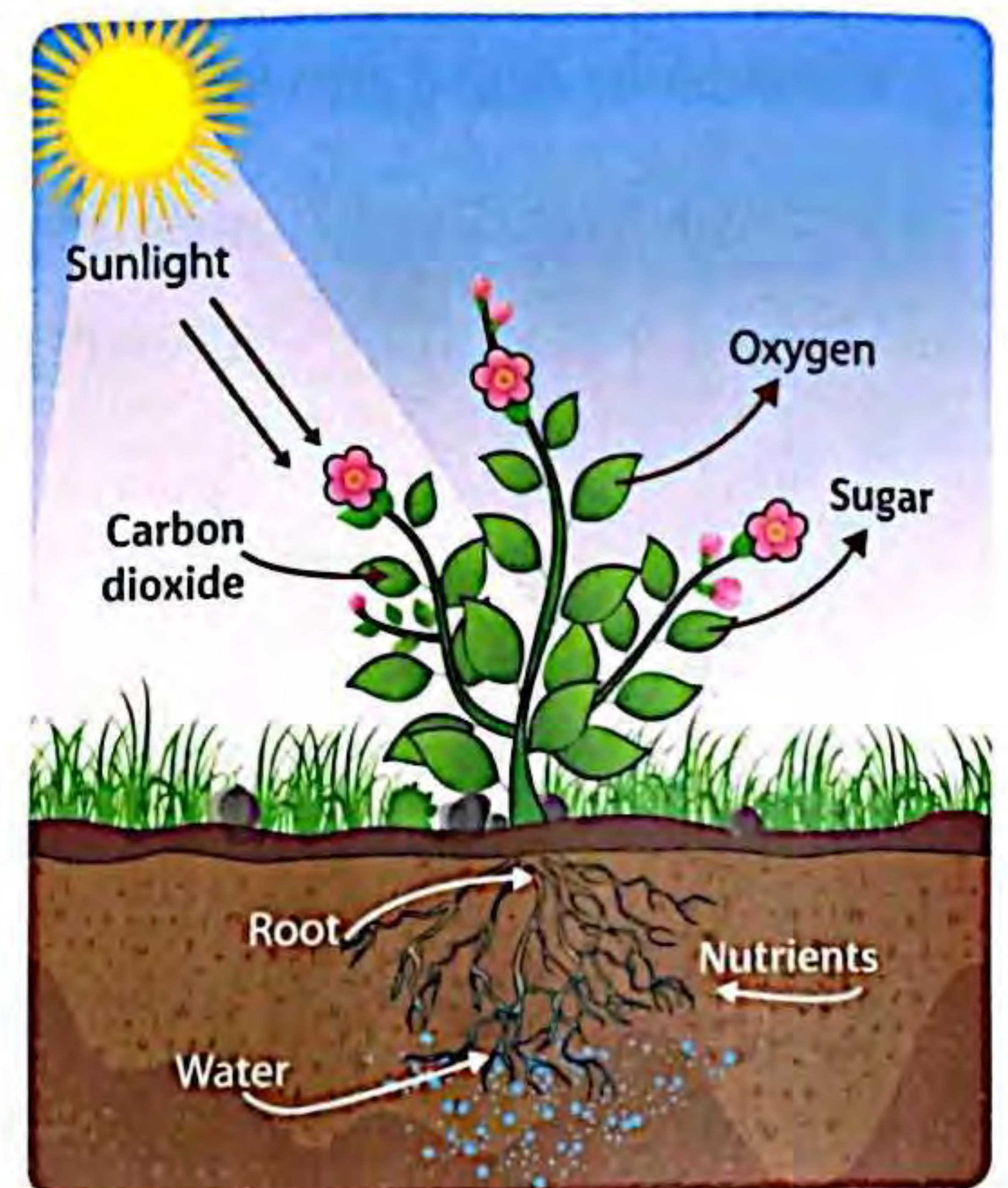
Green leaves use the light energy from the Sun to combine the carbon dioxide from the air with water.

↓

Leaves manufacture (produce) :
- Nutrients (such as sugars, starches, fats and proteins) that the plant needs to survive.
- Oxygen gas that animals and people need to breathe.

↓

As the photosynthesis process is completed inside the leaves, there are tubes called phloem that transport the food materials from the leaves to the other parts of the plant.




### ? Give a reason for :

**The life on Earth without plants would be impossible.**

Because during photosynthesis process plants produce oxygen gas that animals and people need to breathe.



## Check your understanding

▶ **Choose from column (B) what suits it in column (A) :**

| (A) | (B) |
|---|---|
| 1. Stems | a. make food for the plant. |
| 2. Roots | b. gives leaves their green color. |
| 3. Leaves | c. support leaves and flowers of the plant. |
| 4. Chlorophyll | d. fix the plant in the soil. |

1. ........... 2. ........... 3. ........... 4. ...........

| | | | | | |
|---|---|---|---|---|---|
| manufacture | يصنع | starches | النشويات | fats | الدهون |
| phloem | اللحاء | impossible | مستحيل | | |

## Activity 7 Up the Stem

**In this activity, we will observe how the stem transports water and nutrients from the roots to all the plant parts (leaves and flowers) through xylem vessels.**

### Tools


Celery stalk


Glass cup containing water


Food coloring


Scissors

### Steps

1. Fill the cup with water, then add some drops of food coloring to the water.



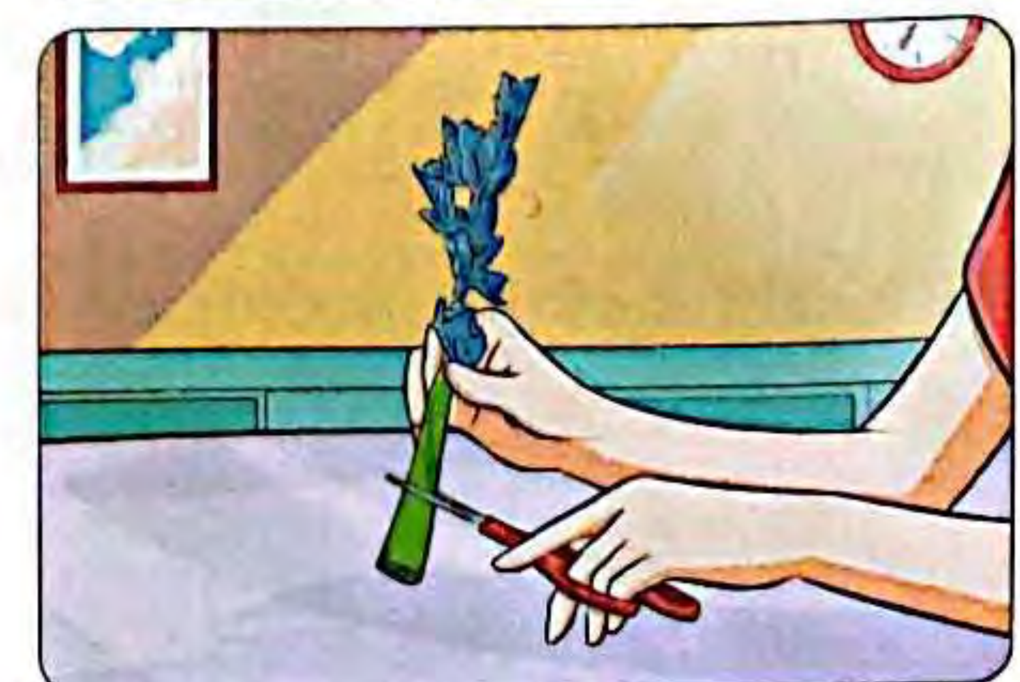
2. Use the scissors to cut about 2 cm off the bottom of the stalk and place it in the cup of water.



3. Leave the stalk in the water cup until the next day.

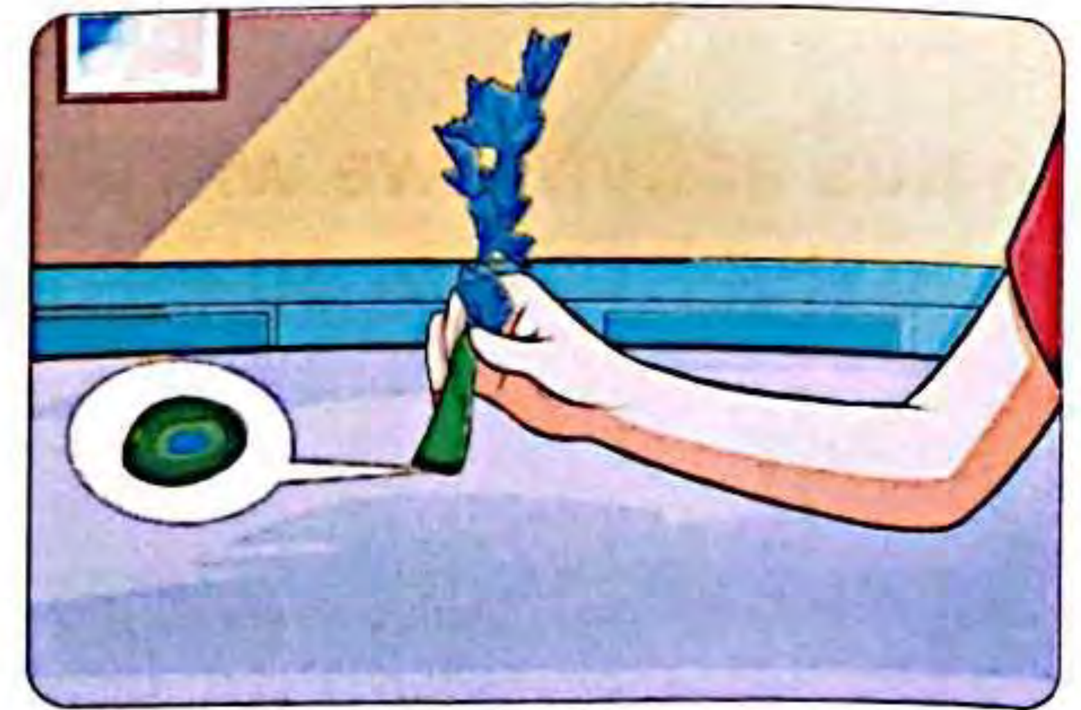


4. Cut across the celery stalk, about 5 cm up from the bottom and observe the xylem vessels inside the stalk.



| | | | | | |
|---|---|---|---|---|---|
| celery stalk | ساق كرفس | drops | قطرات | food coloring | ألوان طعام |

## Observations



- The color of xylem will be turned into the same color of the water in the cup.
- Also, the color of leaves of celery will be turned into the same color of the water in the cup.

## Conclusion

Xylem vessels transport water and nutrients from the plant roots up to its leaves and flowers through the stem.



## Check your understanding

**Put (✓) or (×) :**

1. Water is transported through the xylem in the plant's stem and leaves. (  )
2. Xylem helps carry water upward the plant. (  )

**In the Assessment Book :**
**Try to answer :**
Self-Assessment (3)



turn into يتحول إلى

# Exercises on Lesson 3

● Understand ● Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. The plant's ........... anchor it in the soil.
   a. leaves  b. stems  c. roots  d. flowers
2. There are ........... in the plant's roots that help the plant to get more water and nutrients.
   a. vessels  b. root hairs  c. stomata  d. flowers
3. The tubes that are responsible for moving water and nutrients up the plant's stem are called ...........
   a. roots.  b. xylem.  c. leaves.  d. flowers.
4. ........... plant has climb stem. *(Gharbia 2023)*
   a. Potato  b. Tomato  c. Vine  d. Pine
5. The kind of stems that extend underground are called ........... stems.
   a. climb  b. tuber  c. runner  d. wood
6. Potato plant has ........... stem.
   a. upright  b. climb  c. tuber  d. runner
7. Stomata are present on plant's ........... to allow air to pass through them.
   a. roots  b. stems  c. leaves  d. flowers
8. ........... can make their own food. *(South Sinai 2023)*
   a. Plants only  b. Animals only
   c. Humans only  d. Plants and some animals
9. ........... tree has narrow leaves.
   a. Potato  b. Pine  c. Acacia  d. Grapes
10. The green plants can make their own food through ...........
    a. roots.  b. stems.  c. leaves.  d. flowers.
11. ........... help the plant's leaves to get water and nutrients from the soil.
    a. Roots only  b. Xylem only
    c. Roots and xylem  d. Xylem and stomata
12. All the following parts are important for plants to make photosynthesis process, except ...........
    a. roots.  b. leaves.
    c. stems.  d. flowers.

13. The green color of plant's leaves is due to the presence of ...........

a. xylem. b. phloem. c. chlorophyll. d. stomata.

14. Food materials are transported from the leaves to other parts of the plant through ........... *(Cairo 2023)*

a. xylem. b. phloem. c. chlorophyll. d. stomata.

15. Animals and humans need ........... to breathe.

a. oxygen gas
b. carbon dioxide gas
c. water vapor
d. sugar

16. Green plants produce all the following substances during photosynthesis process, <u>except</u> ...........

a. oxygen gas.
b. carborn dioxide gas.
c. starches.
d. fats.

## 2 Choose from column (B) what suits it in column (A) :

①

| (A) | (B) |
|---|---|
| 1. Pine trees | a. have climb stems. |
| 2. Potato plants | b. have runner stems. |
| 3. Vines | c. have tuber stems. |
| 4. Tree trunks and shrubs | d. have wood stems. |
| | e. have needles leaves. |

1. .................. 2. .................. 3. .................. 4. ..................

②

| (A) | (B) |
|---|---|
| 1. Roots | a. allow gases to come in and out of the plant. |
| 2. Stems | b. collect sunlight and carbon dioxide gas which combines with water to help the plant to make its own food. |
| 3. Leaves | c. tubes or vessels that move water and nutrients up the plant's stem. |
| 4. Xylem | d. absorb water and nutrients from the soil. |
| 5. Stomata | e. transport nutrients and water from the roots to all parts of the plant. |
| | f. absorb oxygen gas from the soil. |

1. .................. 2. .................. 3. .................. 4. .................. 5. ..................

## 3 Put (✓) or (X) :

1. The plant is fixed in the soil by the help of its roots. *(Cairo 2023)* (   )
2. Plant's stem has hairs that absorb oxygen gas from the air. *(Damietta 2023)* (   )
3. Xylem helps the plant to get water from the soil. (   )
4. Xylem is important for plants to transfer water from plant's roots to leaves. *(Dakahlia 2023)* (   )
5. A tree trunk is a type of runner stems. (   )
6. Potato plants have tuber stems. (   )
7. Vines have a kind of stems called climb stems. (   )
8. The leaves of pine trees are flat and wide. (   )
9. Phloem transports food materials from the leaves to other parts of the plant. *(Giza 2023)* (   )
10. Photosynthesis process produces carbon dioxide gas that helps animals and humans to breathe. (   )
11. During photosynthesis process, plant absorbs carbon dioxide gas from air through stomata. (   )
12. There are tiny holes opening on the surface of stem that allow gases to pass into the plant. (   )
13. Water and nutrients reach the plant's leaves with the help of roots only. (   )
14. Plants and humans need water and air to live. (   )
15. Plants need sunlight, oxygen gas and water to make its own food. (   )
16. During photosynthesis process, the plant makes sugars, starches, proteins and fats that help it to survive. (   )
17. Chlorophyll helps the plant leaves to absorb sunlight to make photosynthesis process. (   )
18. Plants and humans are similar in the way of getting food. (   )

## 4 Correct the underlined words :

1. The plant can absorb more water and nutrients from the soil by the help of xylem that are found in the roots. (......................)
2. There are smaller vessels that connect the root to the leaves. (......................)
3. Potato plant has runner stem that extends underground. (......................)
4. The stems that run along the ground are called tuber stems (......................)
5. Most flowers have wood stems. (......................)

6. Stomata allow water to move into and out of the plant. (.....................)
7. Chlorophyll in plant's roots absorbs energy from the sunlight. (.....................)
8. Animals and people can't live without carbon dioxide gas to breathe. (.....................)
9. Xylem tubes inside the leaves transport food materials from the leaves to other parts of the plant. (.....................)

## 5 Write the scientific term of each of the following :

1. A part of the plant that anchors it in the soil. (.....................)
2. Small structures in the plant's roots that increase the absorption of water and nutrients from the soil. (.....................)
3. A part of the plant that supports its leaves and flowers. (.....................)
4. Vessels in plant through which water and nutrients move up from roots to leaves. (.....................)
5. The kind of plant's stem in vines. (.....................)
6. The stems that run along the ground. (.....................)
7. A plant that has a tuber stem. (.....................)
8. Narrow holes spread on the surface of plant's leaves that allow gases to move into and out of the plant. (.....................)
9. It is found in plant's leaves that gives them green color and absorbs energy from the sunlight. *(Alex. 2023)* (.....................)
10. Tubes in the plant that transport food materials from the leaves to other parts of the plant. (.....................)
11. The gas that the plant needs to make photosynthesis process. (.....................)

## 6 Complete the following sentences :

1. Plant's roots ................. the plant in the soil and absorb ................. and water from the soil.
2. The presence of ................. in plant's roots help it to absorb more ................. and nutrients from the soil.
3. There are vessels called ................. in the plant that transport water and nutrients from plant's stem to its leaves.
4. There are many kinds of stems on plants like ................. in vines and ................. in potato.
5. Shrubs have ................. stems, while most flowers have ................. stems.

6. The stems that run along the ground are called ..................
7. There are tiny holes on the plant's leaves called .................. that allow gases to move into and out of the plant. *(Gharbia 2023)*
8. Pine trees have .................. leaves that look like ..................
9. Plant's leaves during photosynthesis process produce .................., starches, fats and .................. that the plant needs to survive.
10. Food materials that are produced by .................. process are transported from the leaves to the other parts of the plant through tubes called ..................
11. The green color of plant's leaves is due to the presence of .................. that absorbs energy from ..................

## 7 Give reasons for :

1. The presence of hairlike structures in plant's roots.

   ..........................................................................................................................................
2. Xylem vessels are important for the plant. *(Giza 2023)*

   ..........................................................................................................................................
3. The presence of stomata on the surface of plant's leaves.

   ..........................................................................................................................................
4. Chlorophyll in plant's leaves has an important role in photosynthesis process. *(Cairo 2023)*

   ..........................................................................................................................................
5. There is no life on Earth in the absence of plants.

   ..........................................................................................................................................

## 8 What happens if ...?

1. The plant doesn't have roots.

   ..........................................................................................................................................
2. Stomata of a plant get closed for a long time.

   ..........................................................................................................................................
3. Plant's leaves don't contain chlorophyll. *(Damietta 2023)*

   ..........................................................................................................................................
4. The plant stops making photosynthesis process for several days.

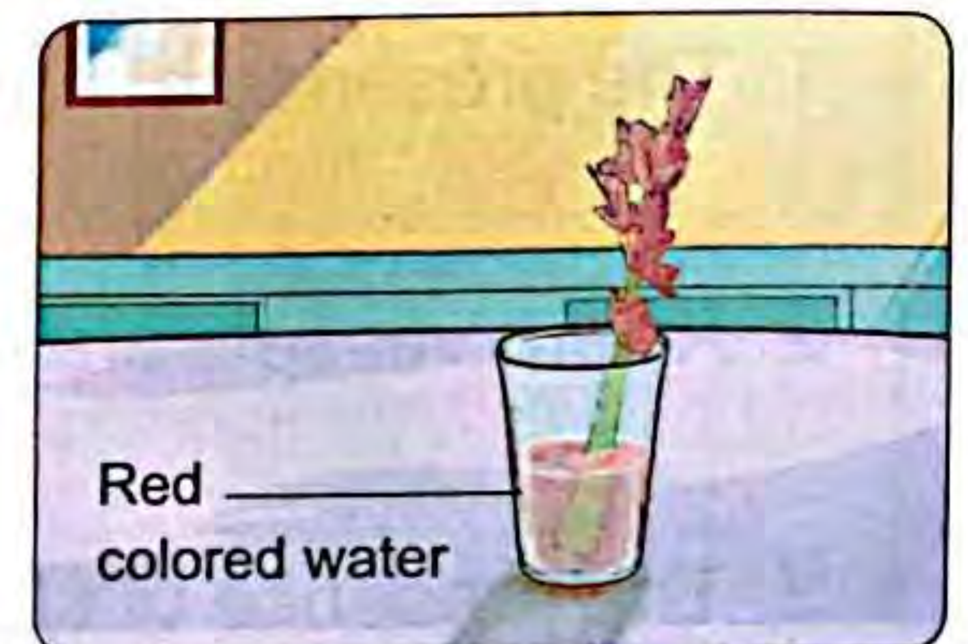
   ..........................................................................................................................................

**9** **Complete the following comparison using these words :**

**( food – xylem – soil – flowers – water – photosynthesis – leaves – nutrients )**

| Point of comparison | Roots | Stems | Leaves |
|---|---|---|---|
| **Function :** | - They fix the plant in the ........(1)........<br>- They absorb ........(2)........ and ........(3)........ from the soil to the plant. | - They transport water and nutrients to the rest of the plant through ........(4)........<br>- They support ........(5)........ and ........(6)........ of the plant. | - They make ........(7)........ for the plant through ........(8)........ process. |

**10** **Look at the opposite figure, then answer :**




1. The color of leaves of celery will be ..................
2. Water is transported through .................. that connect the stem to the leaves.

# LESSON FOUR

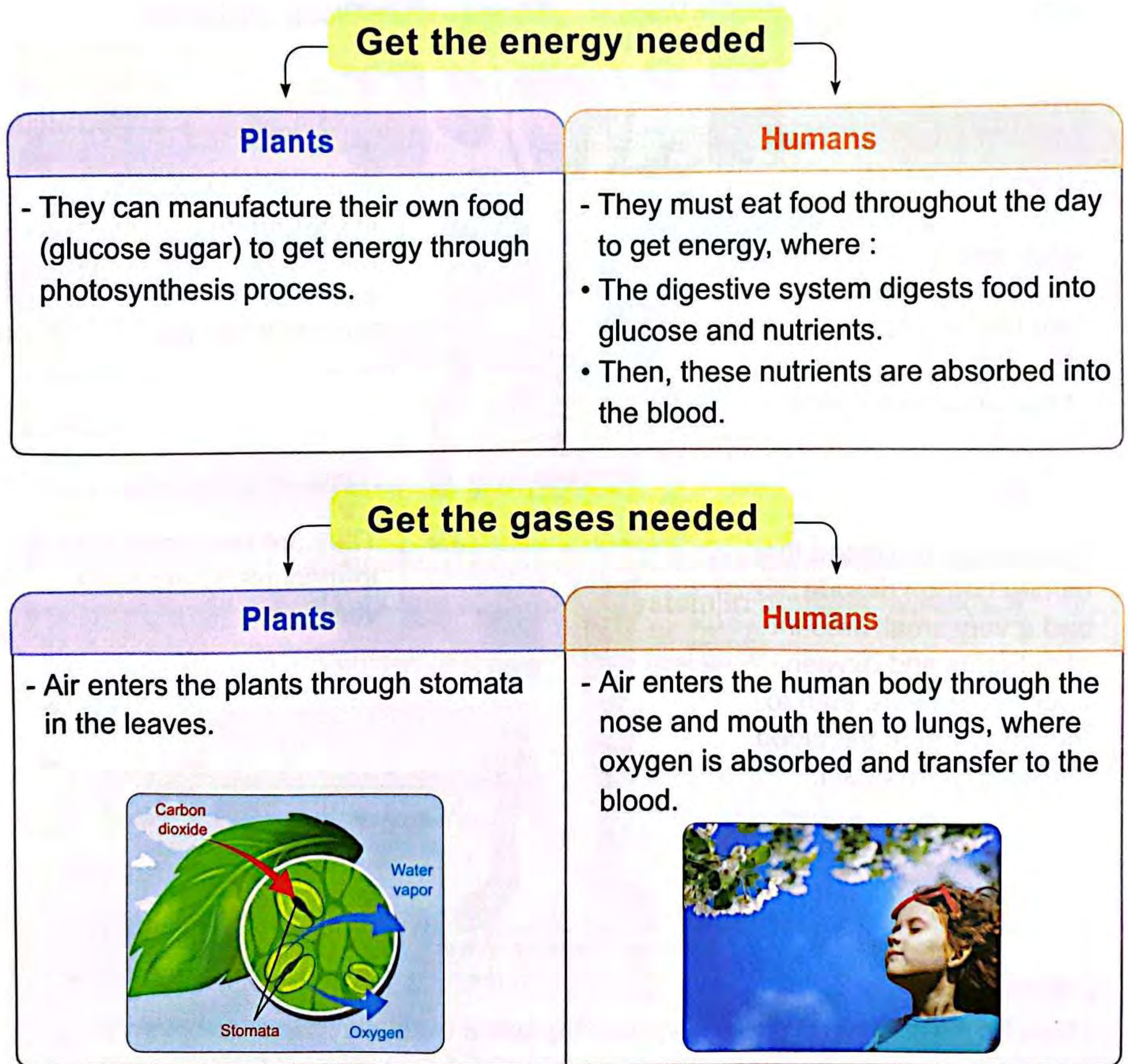
## Activity 8 Comparing Plant and Human Systems

▶ **Put (✓) or (×) :**

1. Plant needs water and air like human to survive. ( )
2. Plant doesn't need energy like human to grow. ( )

### Need for energy

- Both plants and humans need energy and gases from the air to survive and grow as shown in the following diagrams :




| | | | |
|---|---|---|---|
| comparing | مقارنة | manufacture | يصنع |
| digest | يهضم | digestive system | الجهاز الهضمى |

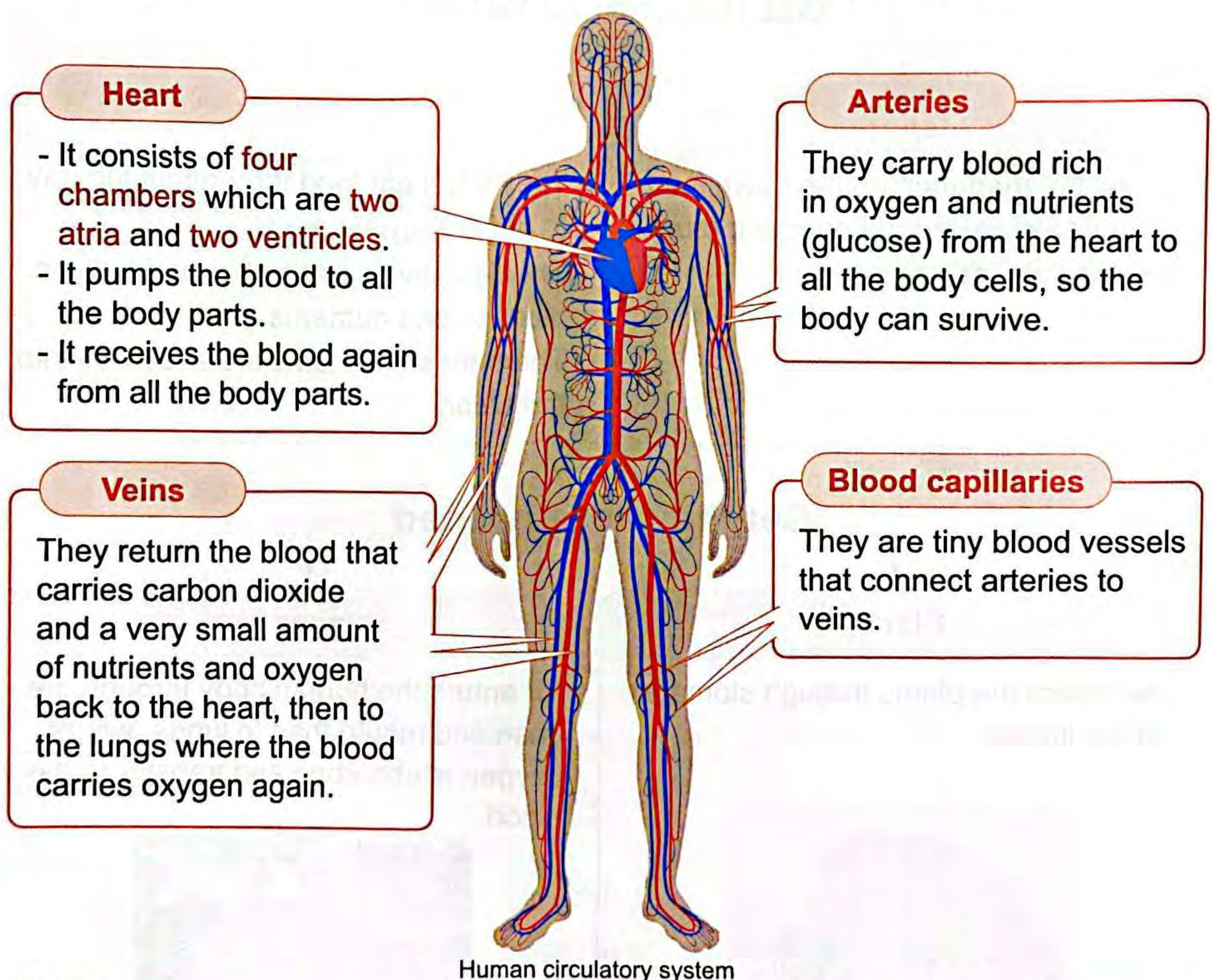
▶ **Now, we will determine how human circulatory system is like plant transport system.**

## Human circulatory system

**It is a system that transports oxygen and nutrients through the blood to all the body cells (parts).**

### Its structure :

- **It consists of :**
  - Heart.
  - Blood vessels (tubes).
- The human circulatory system has three different types of blood vessels which are :
  - Arteries.
  - Veins.
  - Blood capillaries.




Human circulatory system

**Note**
Blood is the fluid that moves in only one direction in the human's arteries or veins.

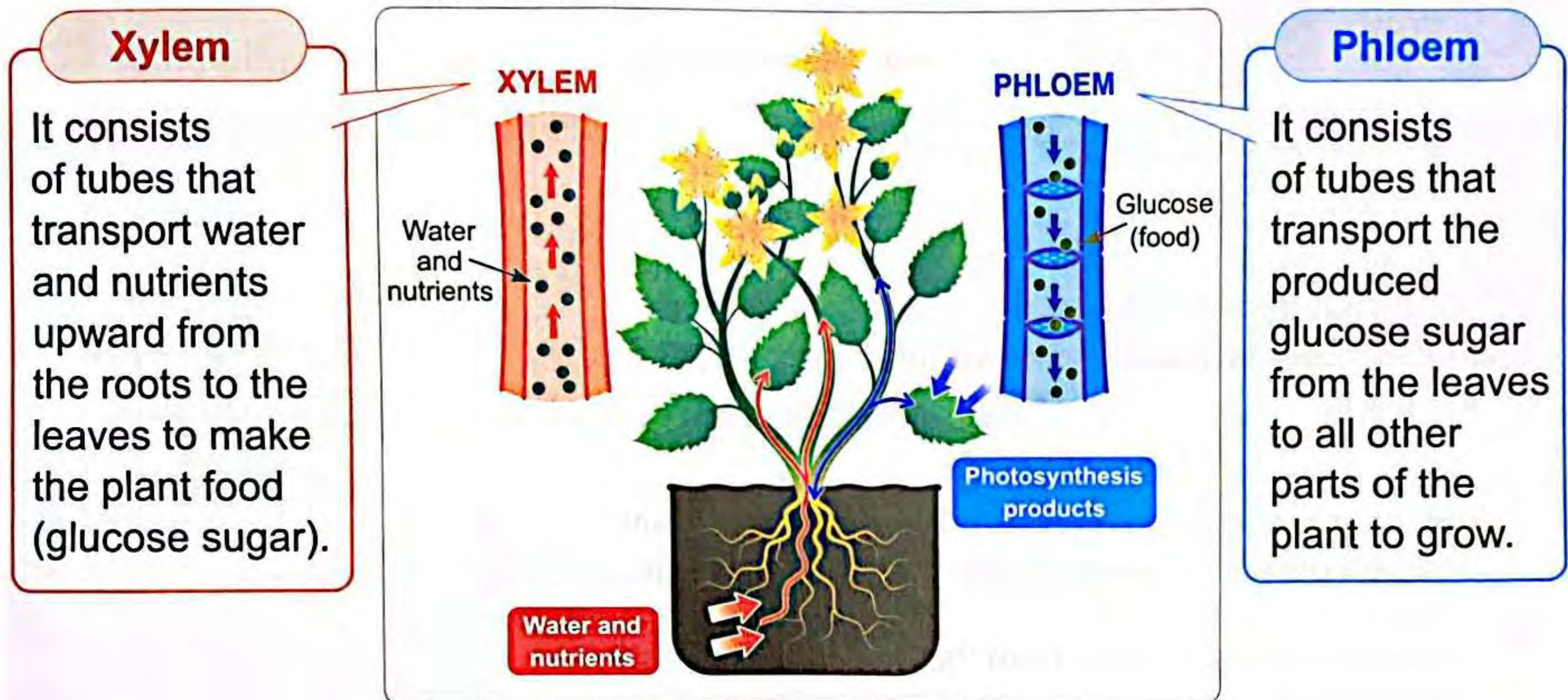
| | | | | | |
|---|---|---|---|---|---|
| circulatory system | الجهاز الدورى | blood vessels | أوعية دموية | blood capillaries | شعيرات دموية |
| transport | ينقل | arteries | شرايين | pump | يضخ |
| veins | أوردة | cells | خلايا | atria | أذينان |
| ventricles | بطينان | | | | |

## Plant transport system (Plant vascular system)

**It is a system of vessels (tubes) that transports water, nutrients and plant food (glucose) between the plant parts.**

### Its structure :

- **It consists of :**
  - Xylem.
  - Phloem.




**Xylem**

It consists of tubes that transport water and nutrients upward from the roots to the leaves to make the plant food (glucose sugar).

**Phloem**

It consists of tubes that transport the produced glucose sugar from the leaves to all other parts of the plant to grow.


**Note**

The transport system in plants has one-way vessels that move important substances between the parts of the plant.

- **From the previous explanation, we can conclude the similarities between the transport system in plants and circulatory system in humans, which are :**
  - Both have vessels to transport water, nutrients and gases.
  - Both have one-way vessels (tubes).



## Check your understanding

▶ **Put (✓) or (×) :**

1. Both plants and humans must take in gases from the air. (   )
2. Veins carry blood rich in oxygen and nutrients. (   )
3. Phloem tubes carry water to leaves. (   )
4. Vessels in plants and humans are one-way vessels. (   )

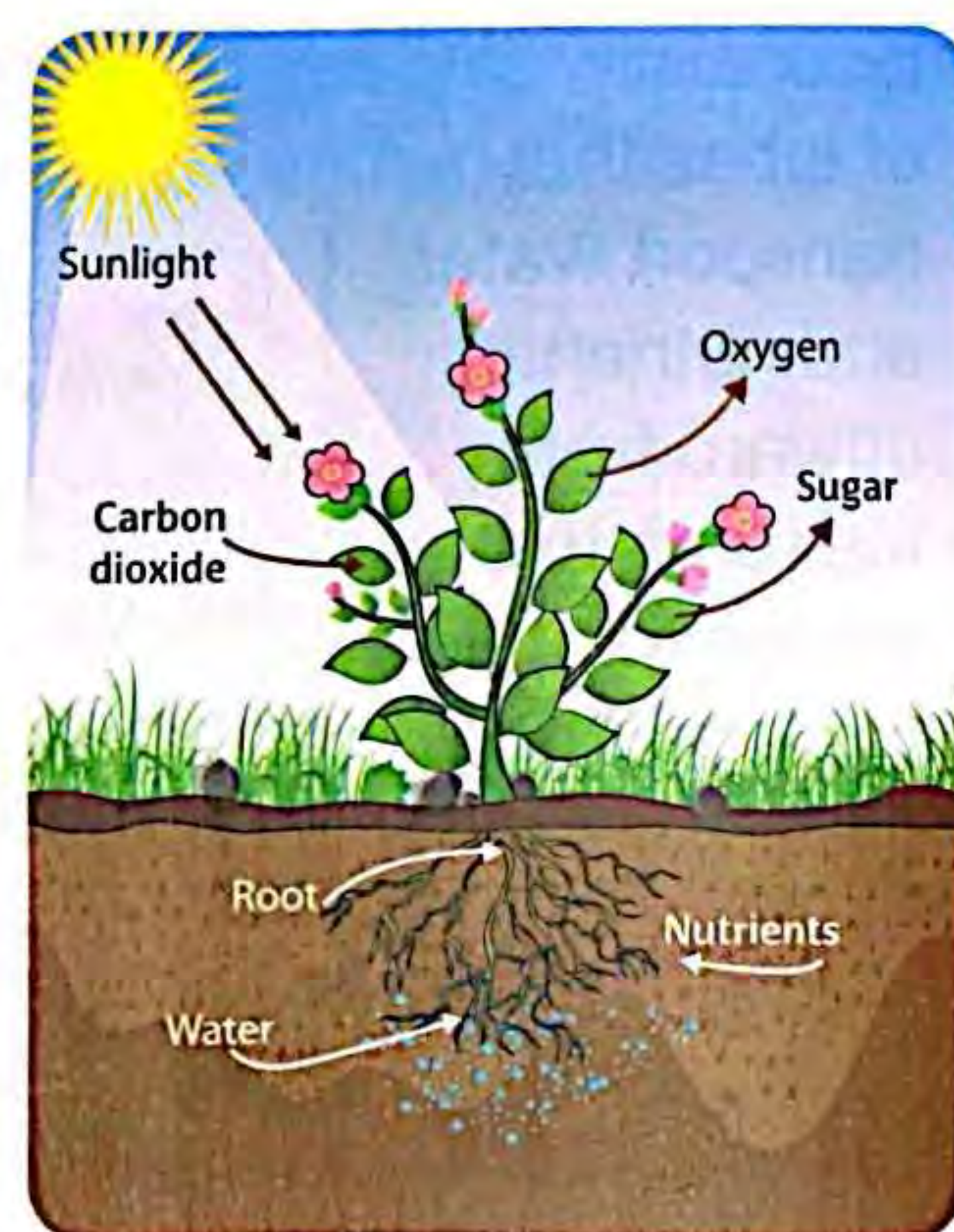
| | | | |
|---|---|---|---|
| transport system | جهاز النقل | xylem | نسيج الخشب |
| vascular system | الجهاز الوعائى | phloem | اللحاء |

## Activity 9 Plant Food

- Plants depend on carbon dioxide released by animals to make their own food during photosynthesis process.
- Also, animals depend on oxygen released by plants to breathe.

▶ **We can explain the steps of photosynthesis process in plants to make their food in the following diagram :**

1. Plants have chlorophyll in the leaves that absorbs light energy from the Sun.
2. Plants have stomata in the leaves to allow carbon dioxide enters the plant.
3. Plants have xylem vessels that take in water and nutrients from the soil and move them to other parts of the plant.
4. 
   - In plant's leaves, sunlight helps water combine with carbon dioxide to make glucose sugar which is used by plant cells for food.
   - Phloem moves glucose from the leaves to the other parts of the plant as a source of energy to live and grow.
5. During photosynthesis process, the plant also produces oxygen and water vapor which are released into the air.



Photosynthesis process



**Note**
During photosynthesis process, light energy of the Sun is transformed into chemical energy that is found in glucose.



### Check your understanding

▶ **Complete the following sentences using these words :**

**(stomata – light – chlorophyll – chemical)**

1. Plants have .................. in their leaves to absorb sunlight.
2. Plants have .................. in their leaves to allow carbon dioxide enters the plant.
3. During photosynthesis process, .................. energy is transformed into .................. energy.



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| transform | يتحول | chemical energy | طاقة كيميائية | source | مصدر | release | يطلق |

# Activity 10 Flowers and Seeds

## Reproduction of plants

- Plants use the food they make to produce flowers which are responsible for reproduction.
- Flowers have different shapes, sizes and colors, where :
  - Some plants have large colorful flowers.
  - Some other plants, such as grasses have very small flowers and some flowers are not very colorful.



**Flowers :**

They are the reproductive parts of many plants.

**Function of flowers :**

They produce seeds that help the plant to reproduce.

**Plant reproduction :**

It is the process of making new plants.

**Notes**

1. When seeds receive air, water and suitable temperature, they can grow into a new plant.
2. In the sunflower, the seeds are the small dark-colored objects in the center of this flower.





## Check your understanding

▶ Put (✓) or (×) :

1. In many plants, flowers are responsible for reproduction. (   )
2. When seeds receive air and suitable temperature only, they grow into a new plant. (   )

**In the Assessment Book :**
Try to answer :
Self-Assessment (4)

| | | | | | |
|---|---|---|---|---|---|
| reproduction | التكاثر | reproductive | تكاثرى | temperature | درجة الحرارة |
| colorful | ملون | seeds | بذور | sunflower | دوار / عباد الشمس |
| grasses | الأعشاب | suitable | مناسب | responsible | مسئول |

# Exercises on Lesson 4

● Understand ○ Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. The human system that moves blood through the body is called ........... system.
   a. digestive b. respiratory c. circulatory d. nervous

2. Air enters the human body through the ...........
   a. nose only. b. mouth only.
   c. nose and mouth. d. mouth and stomach.

3. The human circulatory system consists of ...........
   a. lungs and heart. b. heart and blood vessels.
   c. blood vessels and stomach. d. heart and pancreas.

4. ........... carry blood which is rich in oxygen and glucose from the heart to the body cells. *(Dakahlia 2023)*
   a. Arteries b. Veins
   c. Lungs and veins d. Brain and veins

5. Blood rich in carbon dioxide gas returns back to the heart through ...........
   a. arteries. b. veins. c. lungs. d. xylem.

6. ........... system in plants consists of tubes that water and nutrients move through it.
   a. Digestive b. Respiratory c. Transport d. Nervous

7. The heart in the human circulatory system consists of ...........
   a. two arteries and two ventricles. b. two atria and two ventricles.
   c. two veins and two atria. d. two ventricles and two veins.

8. Glucose sugar is transported from the leaves to other parts of the plant through ........... *(Alex. 2023)*
   a. xylem. b. phloem. c. roots. d. stems.

9. ........... in the leaves allow air to enter the plant. *(Giza 2023)*
   a. Xylem b. Phloem c. Stomata d. Chlorophyll

10. In plant's leaves, light energy is converted into ........... energy during photosynthesis process. *(Damietta 2023)*
   a. sound b. electric c. chemical d. kinetic

11. Plants can produce new seeds by ...........
   a. roots. b. leaves. c. stems. d. flowers.

12. The reproductive parts of many plants are called ..........
    a. veins. b. roots. c. leaves. d. flowers.

13. In .......... , its seeds are small dark-colored objects in the center of this flower.
    a. pine tree b. sunflower c. potato plant d. celery

## 2 Put (✓) or (X) :

1. Air enters plants through their roots. ( )
2. Living organisms need food and gases from the air to survive and grow. ( )
3. Human circulatory system consists of the heart and the lungs. ( )
4. Arteries are vessels in human circulatory system that carry blood rich in carbon dioxide gas. *(Sharkia 2023)* ( )
5. The heart in the human circulatory system consists of two chambers. ( )
6. Oxygen and glucose are transported from the heart to the body cells through arteries. ( )
7. Phloem transports water and nutrients from the roots to the leaves. ( )
8. Glucose is a type of sugar that is produced from plants during photosynthesis process. ( )
9. The reproductive parts of many plants are flowers. ( )
10. Plant's seeds are formed inside the flowers. ( )

## 3 Correct the underlined words :

1. Human circulatory system consists of the lungs and blood vessels. (....................)
2. Brain pumps blood to all the body parts.
3. Each of xylem in plants and veins in human are two-ways vessels. (....................)
4. Veins carry blood rich in oxygen and nutrients. (....................)
5. During photosynthesis process, light energy is transformed into sound energy. (....................)
6. Plants make glucose during respiration process that provides them with energy. (....................)
7. Flowers of plants produce root hairs that help the plant to reproduce. (....................)

## 4 Write the scientific term of each of the following :

1. Smaller vessels that transport water and nutrients from the plant roots up through the stem to its leaves and flowers. (....................)
2. The human body system that consists of heart and blood vessels. (....................)

3. It pumps the blood to all the body parts and receives it again. (....................)
4. Tiny blood vessels that connect arteries to veins. (....................)
5. A system of tubes through which water, nutrients and plant food are carried all over the plant. (....................)
6. Blood vessels carry blood from the heart to all the body parts. (....................)
7. Blood vessels carry blood from the body parts and return it back to the heart. (....................)
8. A type of sugar produced by the plant during photosynthesis process. (....................)
9. Vessels move glucose from the leaves to other parts of the plant. (....................)
10. Parts of the plant that are responsible for reproduction. (....................)
11. The process of producing new plants. (....................)

## 5 Complete the following sentences :

1. Plants make their food in the form of ................. sugar during photosynthesis process.
2. Air enters plants through stomata on their ................. , while it enters the human body through ................. and .................
3. Human circulatory system consists of ................. and .................
4. Arteries carry blood rich in ................. and ................. from the heart to all the body parts.
5. The nutrients and oxygen are transported through the blood to the body cells by the ................. system.
6. The heart in the human circulatory system consists of ................. and .................
7. The plant makes sugar in its ................. during photosynthesis process.
8. Transport system in the plant consists of two types of vessels which are ................. and .................
9. Arteries carry oxygen and nutrients from the ................. to all the body parts, while ................. in plant's stem carries water from the ................. to the leaves.
10. In plant's leaves, ................. energy is converted into ................. energy during photosynthesis process. *(Menofia 2023)*
11. Flowers of the plant produce ................. that help it to .................
12. There are three types of vessels in the human circulatory system which are ................. , ................. and ................. *(Cairo 2023)*

## 6 Give reasons for :

1. Xylem in plant is a one-way vessel.

......................................................................................................................................

......................................................................................................................................

2. Flowers are important parts for the plant.

......................................................................................................................................

......................................................................................................................................

## 7 What happens if ...?

1. Plants can't produce glucose sugar during photosynthesis process.

......................................................................................................................................

......................................................................................................................................

2. We remove the flowers of a plant. *(Menofia 2023)*

......................................................................................................................................

......................................................................................................................................

## 8 Complete the following comparison using these words :

**(xylem – veins – plant parts – blood – phloem – arteries)**

| Plant transport system | Human circulatory system |
|---|---|
| - It transports different materials around the ......(1)...... | - It transports the ......(2)...... around the human body. |
| - Water and nutrients are carried from the roots to the leaves through ......(3)......tubes. | - Blood rich in oxygen and nutrients is carried from the heart to all the body parts through ......(4)...... |
| - Sugars are carried from the leaves to all the plant parts through ......(5)...... | - Blood rich in carbon dioxide is carried from all the body parts to the heart through ......(6)...... |

## 9 Arrange the following sentences to describe the process that converts energy from the Sun into food inside the plant in the correct order :

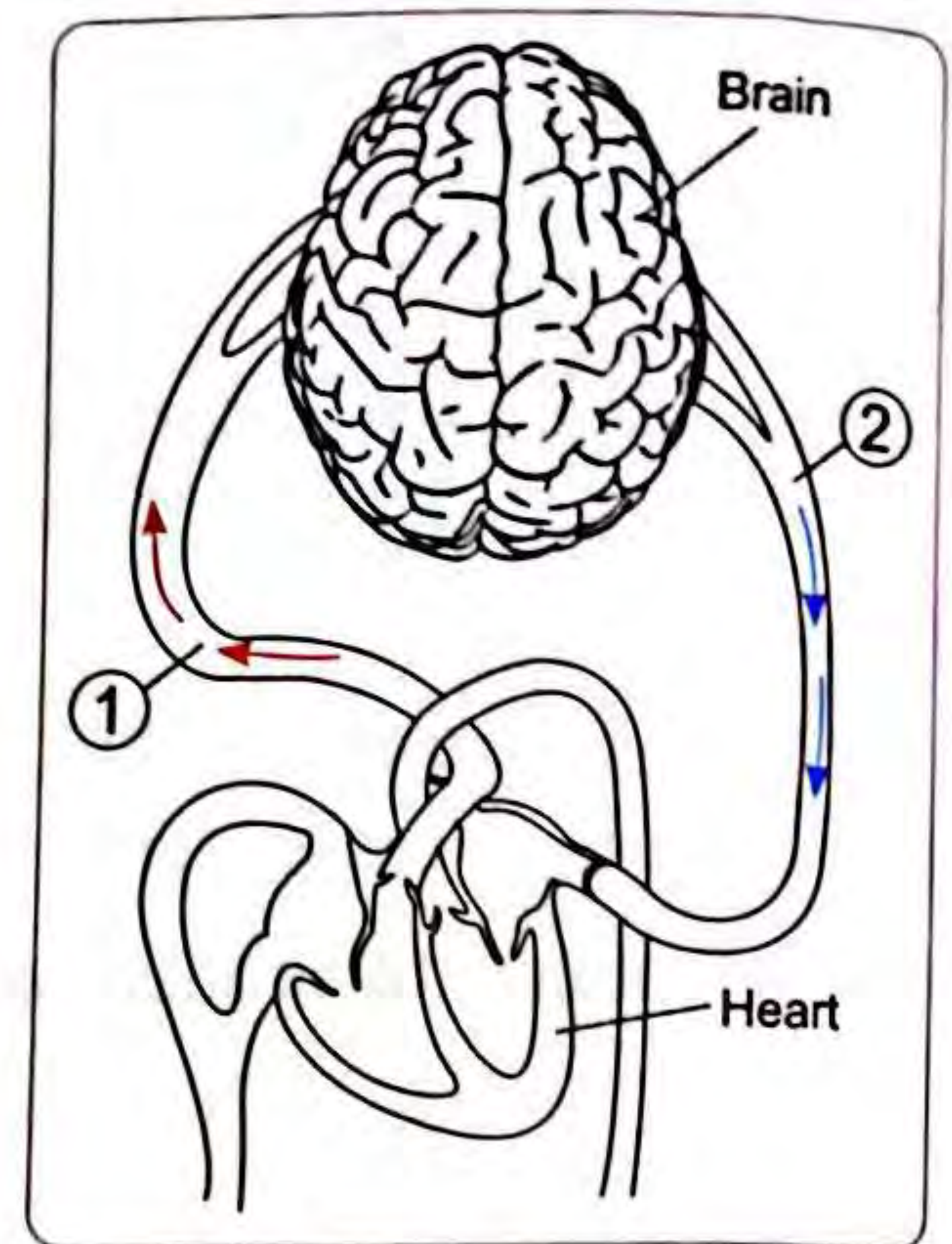
(..........) Vessels move glucose from the leaves to other parts of the plant.

(..........) Light from the Sun hits plant's leaves.

(..........) Plant parts use the glucose for their needs and growth.

(..........) The leaves transform light energy from the Sun into glucose (chemical energy).

**10 Look at the opposite figure, then answer the questions :**




1. Label the figure :

   ① .................. ② ..................

2. Vessel number .................. transfers blood rich in carbon dioxide gas, while vessel number .................. transfers blood rich in oxygen gas.

3. Choose the correct answer :

   Vessels number ① and ② belong to .................. system.

   a. digestive b. respiratory
   c. circulatory d. nervous

# LESSON FIVE

## Activity 11 Seed Dispersal

▶ **Put (✓) or (✗) :**

1. Plants use the energy they get from food they make to produce seeds. ( )
2. Flowers produce seeds for the plant to help it to reproduce. ( )

• Seeds are transported from one place to another, this process is called seed dispersal.

### Ways of seed dispersal in nature

**(1) Water:**

Seeds that are dispersed by water can float on water.

Example: Coconut seeds.



**(2) Wind:**

Seeds that are dispersed by wind are light.

Examples:

• Maple seeds. • Dandelion seeds.





**(3) Animals or human transport:**

Seeds that are dispersed by animals or human transport can stick to animal fur or human clothes.

Example: Burr seeds (have spines).



**(4) Seeds that are eaten by animals:**

Some seeds can be dispersed when they come out with the animals' stool in another place.

Examples:

• Tomato seeds. • Apple seeds.







**Note**

Different ways of seed dispersal depend on the different properties of seeds (such as : size, shape , ...... etc).



### Check your understanding

▶ **Put (✓) or (✗) :**

1. Light seeds travel in the air. ( )
2. Seeds with spines stick to animal fur. ( )

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| nature | الطبيعة | light | خفيفة | spines | أشواك | maple seeds | بذور القيقب |
| float | يطفو | stick | يلصق / يعلق | stool | البراز | burr seeds | بذور البرقوق |
| dandelion seeds | بذور الهندباء | fur | فراء | coconut seeds | بذور جوز الهند | | |

## Activity 12 Record Evidence Like A Scientist

You have learned a lot about plant needs and plant structures.

In this activity, which will be repeated at the end of each concept, we will learn how to think like scientists to answer a question about one of the main points of this concept through four main steps :

- **Step** (1) : The Question.
- **Step** (2) : My Claim.
- **Step** (3) : My Evidence.
- **Step** (4) : My Scientific Explanation.

### ? Step 1 The Question

How do the structures of a plant use water, air and light to perform life processes ?



### Step 2 My Claim

- Plants use different parts to obtain their basic needs of water, air and light to make their own food.
- Each part of a plant has a function to help it survive.

**Note**

Your claim should be formed of a sentence that gives an answer for the previous question in step (1).



### Step 3 My Evidence

- In most plants, the roots absorb water and nutrients from the soil and then the stem moves the water up to the leaves.
- If a green plant is placed in a dark place for many days, their leaves will turn yellow and the plant will die, so green plant needs sunlight to survive.

**Note**

You should mention enough and suitable evidence that support your claim.

| | | | | | |
|---|---|---|---|---|---|
| repeat | يكرر | die | يموت | evidence | دليل |
| claim | فرض | previous | السابق | | |

##  Step 4 My Scientific Explanation

- Plant roots absorb water and nutrients from the soil, then the stem transports them to the leaves through xylem.
- Plant leaves absorb carbon dioxide from air through stomata and absorb the sunlight through chlorophyll.
- During photosynthesis process, green leaves use the light energy from the Sun to combine the carbon dioxide from the air with water to produce glucose sugar (plant's food) and oxygen gas that all living organisms need to breathe.

**Note**

Your scientific explanation should explain your claim and evidence introducing some supportive examples from what you have learned.

## Review on Concept (1-1)

To review this concept look at the **Assessment Book** "Part 2 : Final Revision".

**In the Assessment Book :**
**Try to answer :**
Self-Assessment (5)
Model Exam on Concept (1.1)

| | | | | | |
|---|---|---|---|---|---|
| scientific explanation | تفسير علمي | introduce | يقدم | supportive | داعم |

# Exercises on Lesson 5

● Understand ● Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. The movement of seeds from a place to another is called ..........
   a. seeds germination. b. seeds dispersal.
   c. seeds reproduction. d. seeds growth.
2. All the following can help in seed dispersal, except ..........
   a. wind. b. water.
   c. human and animals. d. soil and sunlight.
3. Maple seeds travel by wind because they are .......... *(Cairo 2023)*
   a. light seeds. b. spiny seeds. c. heavy seeds. d. smooth seeds.
4. Burr seeds have spines, so they can ..........
   a. float on water. b. travel by wind.
   c. stick to animal fur. d. be eaten by animals.
5. From the ways of seeds dispersal is floating on water as in .......... *(Suez 2023)*
   a. burr seeds. b. tomato seeds.
   c. dandelion seeds. d. coconut seeds.

## 2 Choose from column (B) what suits it in column (A) :

| (A) | (B) |
|---|---|
| 1. Coconut seeds | a. sticking to animal fur. |
| 2. Maple seeds and dandelion seeds | b. floating on water. |
| | c. being eaten by animals. |
| 3. Burr seeds | d. traveling by wind. |
| 4. Tomato seeds and apple seeds | e. staying inside flowers without movement. |

1. .............. 2. .............. 3. .............. 4. ..............

## 3 Put (✓) or (✗) :

1. Seeds germination means the transportation of seeds from one place to another. ( )
2. There are many ways of seeds dispersal in nature. ( )
3. Coconut seeds can float on water. ( )
4. Dandelion seeds have spines, so they stick to animal fur. ( )
5. Tomato seeds are light so they can disperse through air. *( Behira 2023)* ( )
6. Human could be one of the ways of seed dispersal. ( )

## 4 Correct the underlined words :

1. Coconut seeds disperse by <u>wind</u>. *(Minia 2023)* (....................)
2. Burr seeds are <u>light</u> seeds. *(Aswan 2023)* (....................)
3. Tomato and <u>coconut</u> seeds being eaten by animals and come out with their stool. (....................)

## 5 Complete the following sentences :

1. Some seeds can be transported from one place to another by floating on water as .................. seeds or traveling by wind as .................. seeds. *(Qalyoubia 2023)*
2. Burr seeds can stick to animal fur because they have ..................
3. Maple seeds and dandelion seeds can travel by wind because they are ..................

## 6 Give reasons for :

1. Seeds dispersal may take place by animal in two different ways.

.......................................................................................................................................

2. Seeds of maple or dandelion plants can disperse through wind easily. *(Fayoum 2023)*

.......................................................................................................................................

3. Burr seeds can stick to animal fur.

.......................................................................................................................................

# Model Exam 1

## on Concept (1.1)

Total mark

15

## 1 (A) Choose the correct answer : *(5 marks)*

1. Blood rich in carbon dioxide gas returns back to the heart through ...........

   a. arteries. b. veins. c. lungs. d. xylem.

2. ........... plant has climb stems.

   a. Potato b. Tomato c. Vine d. Pine

3. Plants produce ........... during photosynthesis process.

   a. water and glucose
   b. oxygen gas and glucose
   c. carbon dioxide gas and water
   d. glucose and carbon dioxide gas

4. All the following can help in seed dispersal, except ...........

   a. wind.
   b. water.
   c. human and animals.
   d. soil and sunlight.

### (B) What happens if ... ?

We put a seed of bean in wet soil for many days.

.............................................................................................................................................

.............................................................................................................................................

---

## 2 (A) Put (✓) or (✗) : *(5 marks)*

1. Blood rich in oxygen gas is carried by veins from the heart to the body parts. (   )
2. Light is important for plant growth. (   )
3. Plant's stem has hairs that absorb oxygen gas from the air. (   )
4. Glucose is a type of sugar that is produced by plants during the photosynthesis process. (   )

### (B) Give a reason for the following :

Burr seeds can stick to animal fur.

.............................................................................................................................................

.............................................................................................................................................

**3** **(A) Write the scientific term of each of the following :** *(5 marks)*

1. A liquid substance that plants, animals and humans need to survive. (..................)
2. Parts of the plant that are responsible for reproduction. (..................)
3. The source of energy for the plant to make photosynthesis process. (..................)
4. The plant that has a tuber stem. (..................)

**(B) Look at the following figures, then complete the following sentences using the words below :**

**(soil – figure Ⓐ – figure Ⓑ)**



Figure Ⓐ



Figure Ⓑ

1. The seeds in .......... grow faster than those in ..........
2. Seeds in figure Ⓑ should be transfered into .......... to complete its growth.

# Model Exam 2

## on Concept (1.1)

Total mark

——

15

**1** **(A) Complete the following sentences :** *(5 marks)*

1. There are smaller vessels that transfer .......... and nutrients from the plant's stem to leaves.
2. In plant's leaves, light energy of the Sun is converted into .......... energy during photosynthesis process.
3. Arteries carry oxygen and nutrients from the .......... to all the body parts.
4. Tree trunks have .......... stems.

**(B) Give a reason for the following :**

There is no life on Earth in the absence of plants.

.......................................................................................................................

.......................................................................................................................

**2** **(A) Choose from column (B) what suits it in column (A) :** *(5 marks)*

| (A) | (B) |
|---|---|
| 1. Roots<br>2. Stems<br>3. Leaves<br>4. Stomata | a. allow gases to move into and out of the plant.<br>b. collect sunlight and carbon dioxide gas which combines with water to help the plant to make its own food.<br>c. absorb water and nutrients from the soil.<br>d. transport water and nutrients from the roots to all parts of the plant.<br>e. absorbs oxygen gas from the soil. |

1. ................ 2. ................ 3. ................ 4. ................

**(B) Correct the underlined words :**

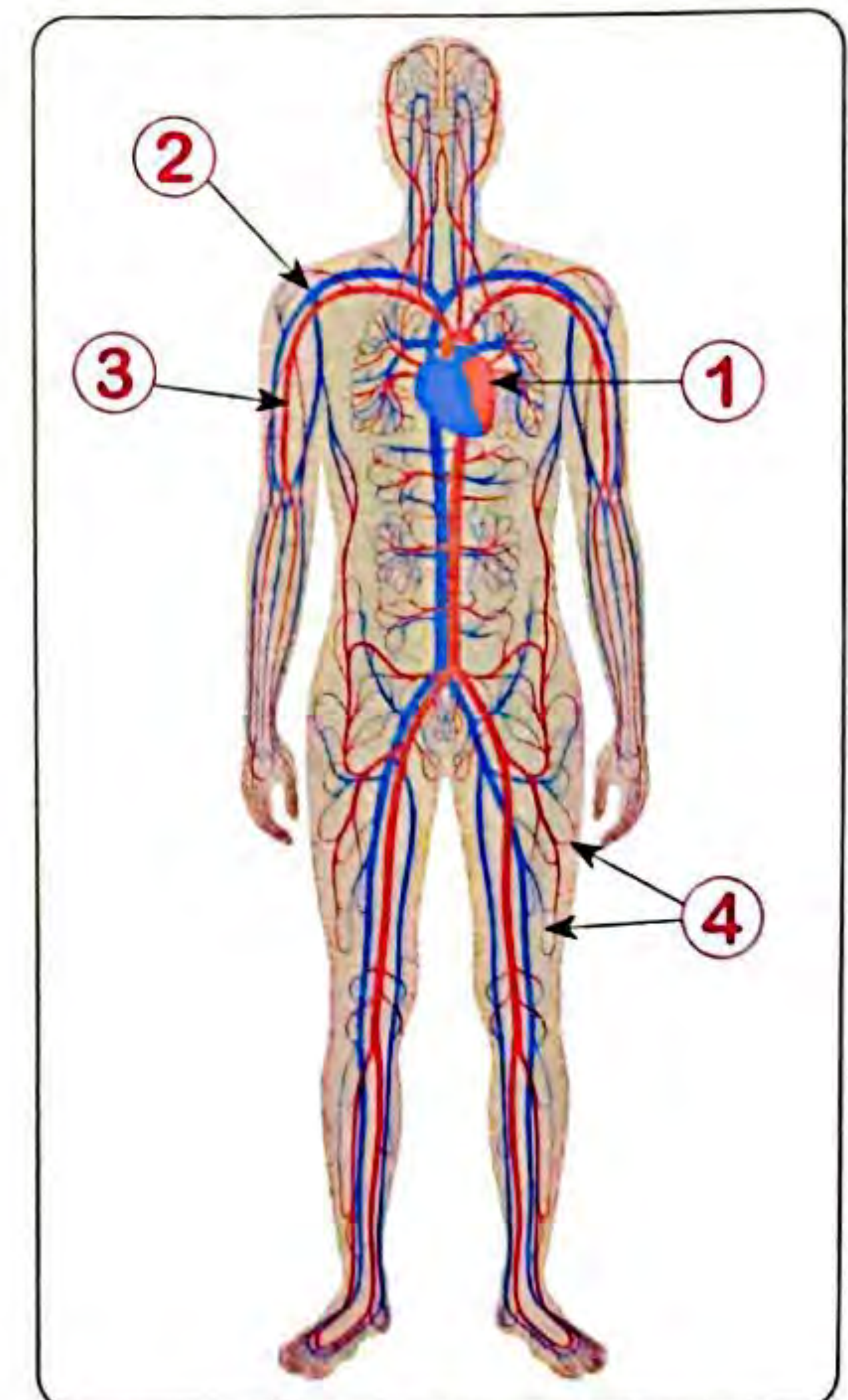
1. Chlorophyll in plant's <u>roots</u> absorbs energy from the sunlight. (...................)
2. <u>Phloem</u> tubes carry water and nutrients from the roots to the leaves. (...................)

## 3 (A) Choose the correct answer : *( 5 marks)*

1. ........... tree has narrow leaves.
   a. Potato  b. Pine  c. Acacia  d. Grapes
2. Plants can produce new seeds by ...........
   a. roots.  b. leaves.  c. stems.  d. flowers.
3. ........... seeds travel by wind.
   a. Coconut  b. Maple  c. Burr  d. Apple
4. The heart in the human circulatory system consists of ...........
   a. two arteries and two ventricles.
   b. two atria and two ventricles.
   c. two veins and two atria.
   d. two ventricles and two veins.

### (B) Look at the opposite figure, then answer :

1. The opposite figure represents the human ........... system.
2. Label the figure :
   ① ..........................................................................
   ② ..........................................................................
   ③ ..........................................................................
   ④ ..........................................................................



Concept 1.2

# Energy Flow in Ecosystems





## Learning outcomes

**By the end of this concept, your child will be able to :**

- Develop a model to show how energy moves through an ecosystem.
- Create a model to explain the different roles that organisms play in an ecosystem.
- Explain how the health of each type of organism in an ecosystem impacts the overall health of the community.

## Key vocabulary

- Consumers
- Cycle
- Decomposers
- Ecosystem
- Food chain
- Food web
- Interact
- Predators
- Prey
- Producers

# Notes For Parents On Concept [1.2]

| Lessons | Activities | What you should do with your child |
|---|---|---|
| 1 | Activity 1 | Explain to your child how does energy flow through an ecosystem from plants to animals and between animals when they eat each other. |
| | Activity 2 | Discuss with your child how hawk gets energy in an ecosystem. |
| | Activity 3 | Explain to your child how animals eat food according to what these animals bodies need to survive. |
| 2 | Activity 4 | Discuss with your child the Sun is the primary source of energy for all organisms on Earth to live and how different living organisms get energy. |
| | Activity 5 | Explain to your child living organisms can be classified into three groups according to their way of feeding. |
| | Activity 6 | Discuss with your child how the movement of energy and nutrients through an ecosystem can be represented using model known as a food chain. |
| 3 | Activity 7 | Let your child make a model of a food chain. |
| | Activity 8 | Explain to your child how all living organisms interact in food webs and we can draw these webs to show how organisms are connected within ecosystem. |
| | Activity 9 | Discuss with your child how the food web is a model that shows many interactions among living organisms in an ecosystem. |
| 4 | Activity 10 | Help your child to think like a scientist by answering a question about one of the main points of this concept then write his/her claim, evidence and the scientific explanation. |
| | Activity 11 | Discuss with your child how restoration ecology is very important for plants and animals that help them have a stable environment to survive. |

# LESSON ONE

## Activity 1 Can You Explain ?





- **The pictures above show different types of organisms and their environments.**
- **You probably know a lot about ecosystems which consist of :**
  - Living organisms such as plants, animals and humans.
  - Nonliving things such as air, water , rocks, ... etc.

**Ecosystem :**

It is an area (or community) that contains living organisms and nonliving things that interact with each other.

- The interaction between different components of an ecosystem depends on the flow of energy through these components.

**How does energy flow through an ecosystem ?**

- Energy flows (moves) through an ecosystem from plants to animals and also between animals when they eat each other.
- When living organisms die, their energy is returned to the soil.

**In this concept, we will study :**

- How animals get energy.
- Food is energy.
- Food chains.
- Producers, consumers and decomposers.
- Food webs and their interactions.

| | | | | | |
|---|---|---|---|---|---|
| environment | بيئة | interaction | التفاعل | return | يرجع / يعيد |
| ecosystem | النظام البيئى | components | عناصر | energy | طاقة |
| food web | الشبكة الغذائية | flow | تدفق | food chain | السلسلة الغذائية |
| community | مجتمع | | | | |

## Activity 2 How Hawks Get Energy

▶ **Look at the opposite picture, then put (✓) or (×) :**



1. Hawk can feed on rabbits and rats. ( )
2. Hawk can feed on plant leaves. ( )
3. Hawk hunts its prey to get energy. ( )

### How hawks get energy in their environment



- Hawks get energy from food.
- Hawks generally eat different types of animals such as snakes, mice, fish, birds, squirrels, rabbits and other small ground animals.
- Hawks do not eat plants, but they eat animals who eat plants, so they also depend on plants for energy.

**Note**



There are few predators that can attack hawks such as eagles or other hawks.

▶ **What happens when the hawk dies ?**

When a hawk dies, it decomposes and its energy is returned to the soil.



### Check your understanding

▶ **Put (✓) or (×) :**

1. Hawks eat plants. ( )
2. Hawks get their energy by eating animals only. ( )
3. When a hawk dies, its energy is returned to the soil. ( )

| | | | | | |
|---|---|---|---|---|---|
| hawk | صقر | squirrel | سنجاب | predator | مفترس |
| hunt | صيد | ground animals | حيوانات الأرض | attack | يهجم |
| prey | فريسة | depend on | يعتمد على | decompose | يتحلل |

## Activity 3 What Do You Already Know About Energy Flow in Ecosystems ?

- An ecosystem is a community that provides food, water and shelter to all living organisms live in it.
- There are many different ecosystems on the Earth such as an ocean, a rainforest, a desert or the tundra.

### What do animals eat ?

Animals eat different types of food (plants, animals or both of them) to get energy.

Examples :

Caracal eats rabbits and mice.



Rabbit eats grass.



Bird eats worms.



**Note**

There is a relationship between sunlight and the energy we get from our food, because the energy we get from food originally comes from the Sun.



### Check your understanding

▶ **Complete the following sentences using these words :**

**( caracal – grass – birds )**

1. Worms can be eaten by ....................
2. Rabbit eats ....................
3. Mouse can be eaten by ....................

**In the Assessment Book :**
**Try to answer :**
Self-Assessment (6)

| | | | | | |
|---|---|---|---|---|---|
| provide | تزود / تمد | shelter | مأوى / مسكن | caracal | كاراكال / القط البرى |
| rainforest | غابة مطيرة | ocean | محيط | originally | فى الأصل |
| tundra | سهل جليدى | | | | |

# Exercises on Lesson 1

● Understand ● Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. A community that includes living organisms and nonliving things is known as ..........
   a. digestive system. b. respiratory system.
   c. ecosystem. d. vascular system.
2. The interaction that is present in an ecosystem occurs between ..........
   a. plants and nonliving things only.
   b. animals and nonliving things only.
   c. animals and plants only.
   d. living organisms and nonliving things.
3. Hawks get their energy by eating .......... *(Giza 2023)*
   a. plants only. b. animals only.
   c. plants and animals. d. nonliving things.
4. Rabbit can be eaten by all the following living organisms, except ..........
   a. hawk. b. caracal. c. grass. d. eagle.
5. All the following are considered as a source of energy for hawks, except ..........
   a. snakes. b. birds. c. squirrels. d. seeds.
6. There is an energy flow between all the following two living organisms, except ..........
   a. a lion and a deer. b. a tomato plant and a potato plant.
   c. a human and a fish. d. a hawk and a mouse.
7. Caracal obtains its energy by eating .......... *(Aswan 2023)*
   a. shark. b. grass. c. mice. d. butterfly.

## 2 Put (✓) or (✗) :

1. There is no interaction between the components of an ecosystem. ( )
   *(Menofia 2023)*
2. When living organisms die, all energies that present in their bodies go to the soil. ( )
3. Hawks do not eat some types of food like plant leaves. ( )
4. There is no energy flow between living organisms that live in seas and oceans. ( )
5. Birds eat insects to get their energy. ( )
6. The energy we get from food originally comes from the Sun. ( )

## 3 Write the scientific term of each of the following :

1. A community that contains living organisms and nonliving things. (....................)
2. A place that provides food, water and shelter to all living organisms that live in it. *(Cairo 2023)* (....................)

## 4 Complete the following sentences :

1. Hawks attack rabbits to get their energy, while rabbits feed on ................ to get their energy.
2. When living organisms die, their energy is returned to the ................ *(Alex. 2023)*
3. An area that provides food, water and shelter to all living organisms which live in it, is known as ................
4. There are many types of ecosystems on the Earth such as ................ , a rainforest and ................

## 5 Give a reason for the following :

Animals eat different types of food.

..........................................................................................................................................

## 6 What happens if ... ?

A hawk is placed in an ecosystem that doesn't contain any living organisms except plants. *(Cairo 2023)*

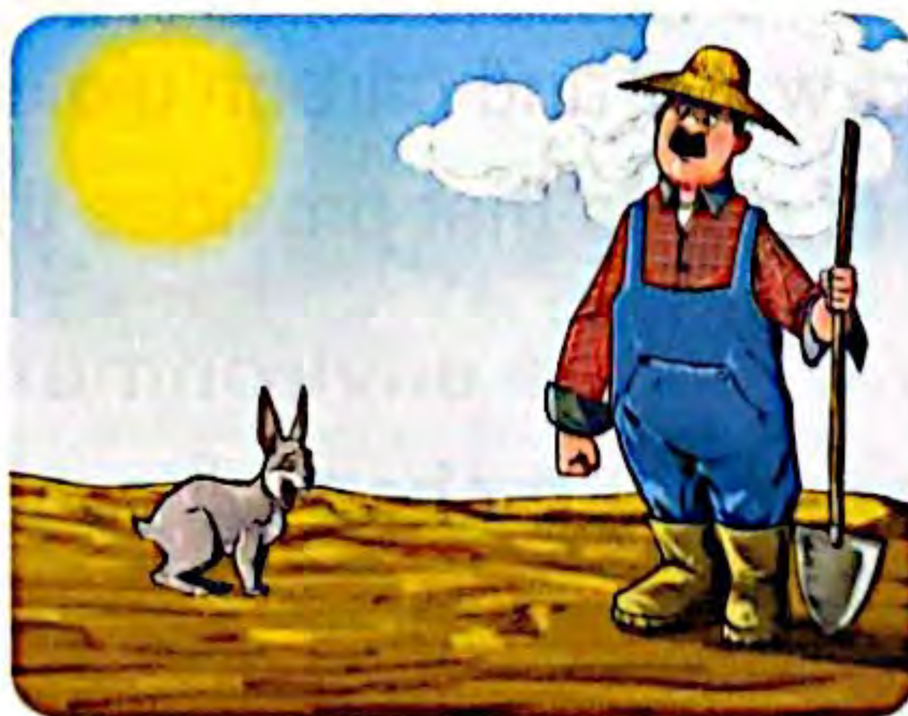
..........................................................................................................................................

## 7 Study the following figures which show three different areas (A) , (B) and (C) , then complete the sentences below :

Area (A)



Area (B)



Area (C)



1. Areas (..........) and (..........) represent an ecosystem that contains two different living organisms, while area (..........) represents an ecosystem that contains three different living organisms.
2. Photosynthesis process doesn't occur in area (..........).
3. Energy flow can be occurred between animal and human in areas (..........) and (..........).

# LESSON TWO

## Activity 4 Food is Energy

▶ **Put (✓) or (✗) :**

**1.** Energy flows from plants to animals in the ecosystem. ( )

**2.** All living organisms get energy from their food. ( )

### How do we get energy ?



- Food and the oxygen we breath provide us with energy that we need throughout the day.
- We need energy to do all activities in our daily life such as thinking, breathing and moving.
- There are some activities require a lot of energy such as hard work or doing exercises.
- Our bodies still use some energy even when we sleep.

### The primary source of energy



**The Sun** is the primary source of energy for all organisms on Earth to live, grow and carry out life processes.

▶ **How plants get energy from the environment :**

- Plants **can make** their own food through **photosynthesis** process by absorbing the sunlight through their leaves and use the sun's energy to convert water and carbon dioxide gas into glucose sugar.
- Glucose sugar is the food of plants that provides them with energy.

▶ **How animals get energy from the environment :**

- Animals including humans **cannot make** their own food, but they get energy from the environment in which they live.
- Different animals can get their food by :
  - Eating plants only.
  - Eating other animals that eat plants.
  - Eating both plants and animals.



| primary source | مصدر أولي | carry out | تنفيذ |
|---|---|---|---|

**From the previous explanation, we can conclude that :**

- The energy produced from the Sun passes through all life on Earth.
- Living organisms can either produce their own food such as plants or get food from other organisms such as animals including humans.
- Photosynthesis process is important for life on Earth.



## Check your understanding

▶ Put (✓) or (✗) :

1. Plants cannot make their own food. ( )
2. The Sun is the primary source of energy for all living organisms on the Earth. ( )
3. There are some activities require a lot of energy such as hard work and sleep. ( )

# Activity 5 Food Chains

## Energy for life



- All living organisms eat food to get the energy they need to survive.
- Living organisms feed on one another, so energy passes between them.
- Living organisms can be classified into three groups according to their way of feeding, which are :

(1) **Producers.** (2) **Consumers.** (3) **Decomposers.**

## 1 Producers

They are able to produce their own food in the form of glucose sugar which is rich in energy.

**Producers :**

They are organisms that can make their own food and don't feed on other plants or animals.

Example : Plants use energy from the Sun to produce their own food by photosynthesis process.





**Note**

Nearly all of the producers on the Earth are plants.

## 2 Consumers

They cannot produce their own food.

**Consumers :**

They are organisms that eat other living organisms to get their energy, because they cannot make their own food.

| | | | | | |
|---|---|---|---|---|---|
| feed on | تتغذى على | producers | كائنات منتجة | decomposers | كائنات محللة |
| classify | يصنف | consumers | كائنات مستهلكة | consume | تستهلك |

Examples : There are three types of consumers which are :

**Primary consumers**

- They are animals that eat plants.
- Many insects are primary consumers.



**Secondary consumers**

- They are animals that eat the primary consumers.
- Birds are secondary consumers, because they eat insects and other organisms that eat plants.



**Tertiary consumers**

- They are animals that eat the secondary consumers.
- Tertiary consumers are often large meat-eating animals like alligators.



## 3 Decomposers

They recycle nutrients back into the ecosystem through the process of decomposition of dead organisms.

**Decomposers :**

They are organisms that carry out the process of decomposition by breaking down or decaying dead organisms.

Examples :

**Fungi**



**Bacteria**



**Notes**

1. Worms and millipedes are considered as decomposers.
2. Worms and millipedes eat dead matter and produce waste which is rich in nutrients that increase the soil fertility for plant growth.



millipede

| | | | | | |
|---|---|---|---|---|---|
| primary consumers | كائنات مستهلكة أولية | recycle | إعادة تدوير | worms | الديدان |
| secondary consumers | كائنات مستهلكة ثانوية | nutrients | عناصر غذائية | bacteria | بكتيريا |
| tertiary consumers | كائنات مستهلكة ثالثية | millipede | الدودة الألفية | decaying | تحلل |
| fungi | فطريات | decomposition | تحلل | fertility | خصوبة |

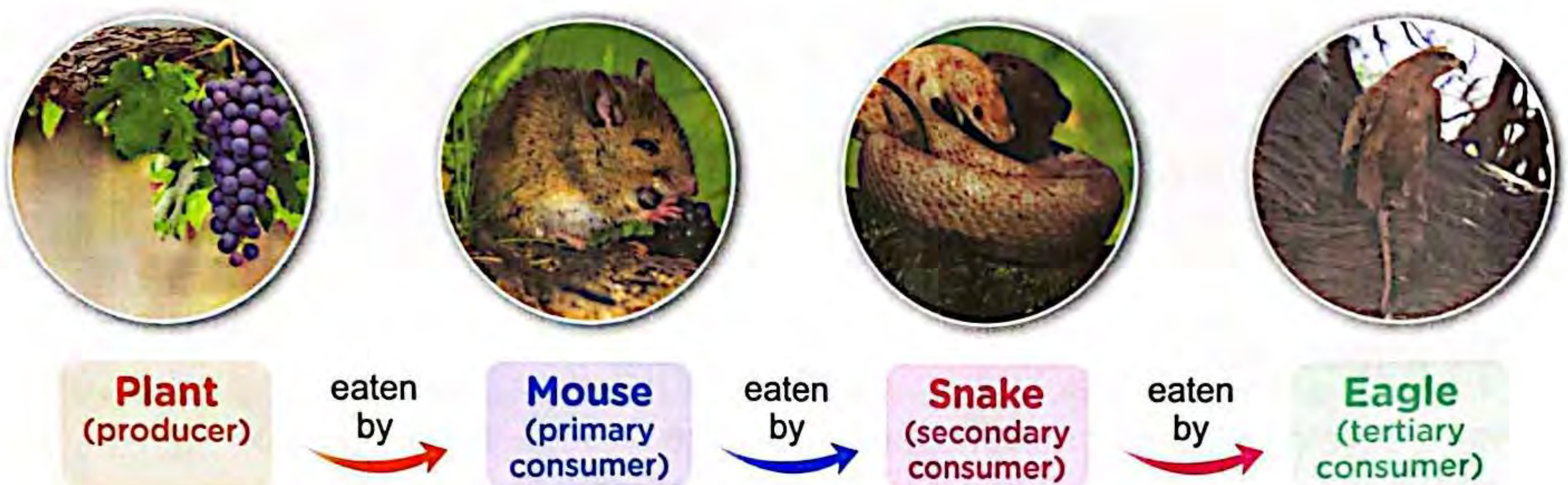
**From the previous explanation, we can conclude that :**

- Energy flows through an ecosystem between living organisms.
- The flow of energy through an ecosystem can be represented using model known as a "food chain".

**Food chain :**

It is a model that shows how energy passes from one organism to another in an ecosystem.

**Example :**




**From the above example, we can conclude that energy passes from one living organism to another through a food chain, where :**

- Producers are considered as the **first** link in any food chain.
- Consumers (primary, secondary and tertiary) are considered as the **second** link in any food chain.
- Decomposers are considered as the **final** link in any food chain, where they decompose the dead organisms and recycle nutrients (energy) back into the ecosystem.



**Check your understanding**

**Complete the following sentences using these words :**

**( producers – decomposers – consumers )**

1. Nutrients are recycled back to the ecosystem by ..................
2. Living organisms that cannot produce their own food are called ..................
3. Living organisms that are able to make their own food in the form of glucose sugar which is rich in energy are called ..................



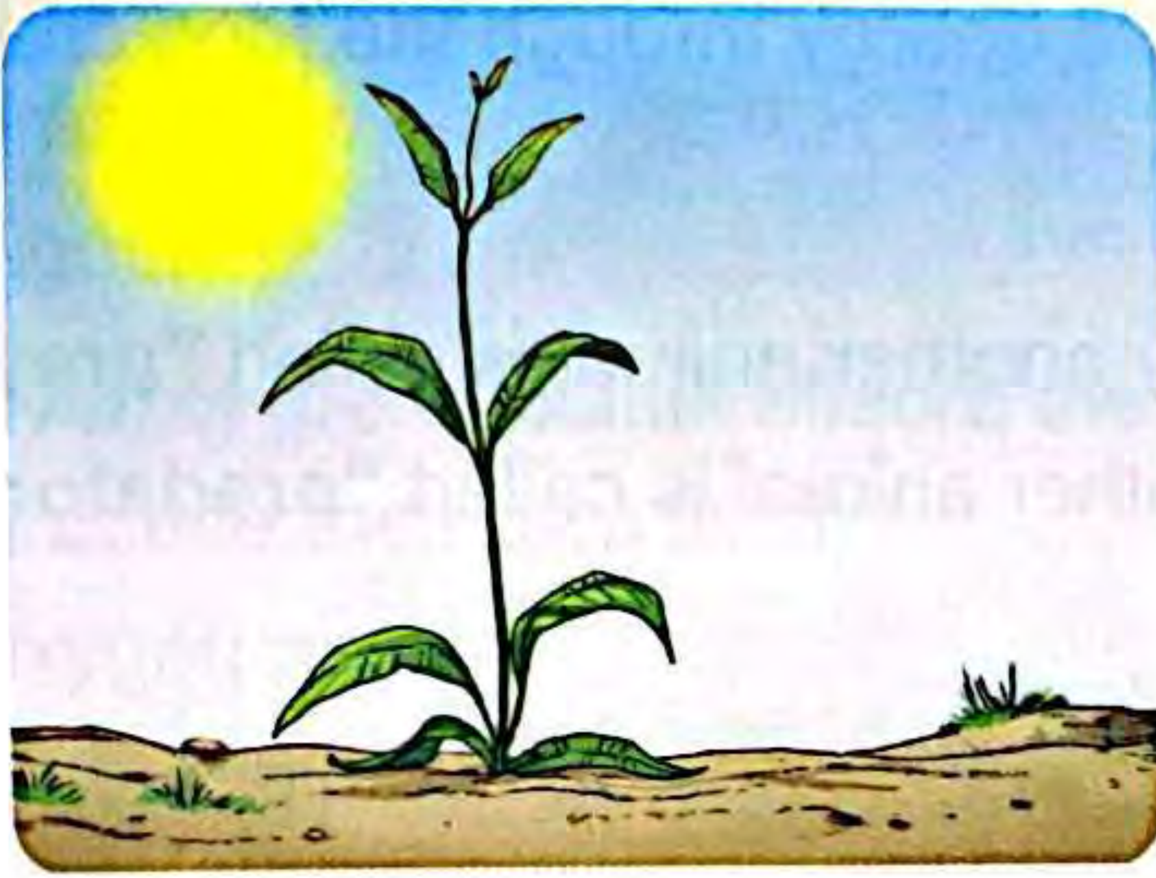
| eagle | نسر | link | حلقة الوصل |
|---|---|---|---|

## Activity 6 Energy Flow

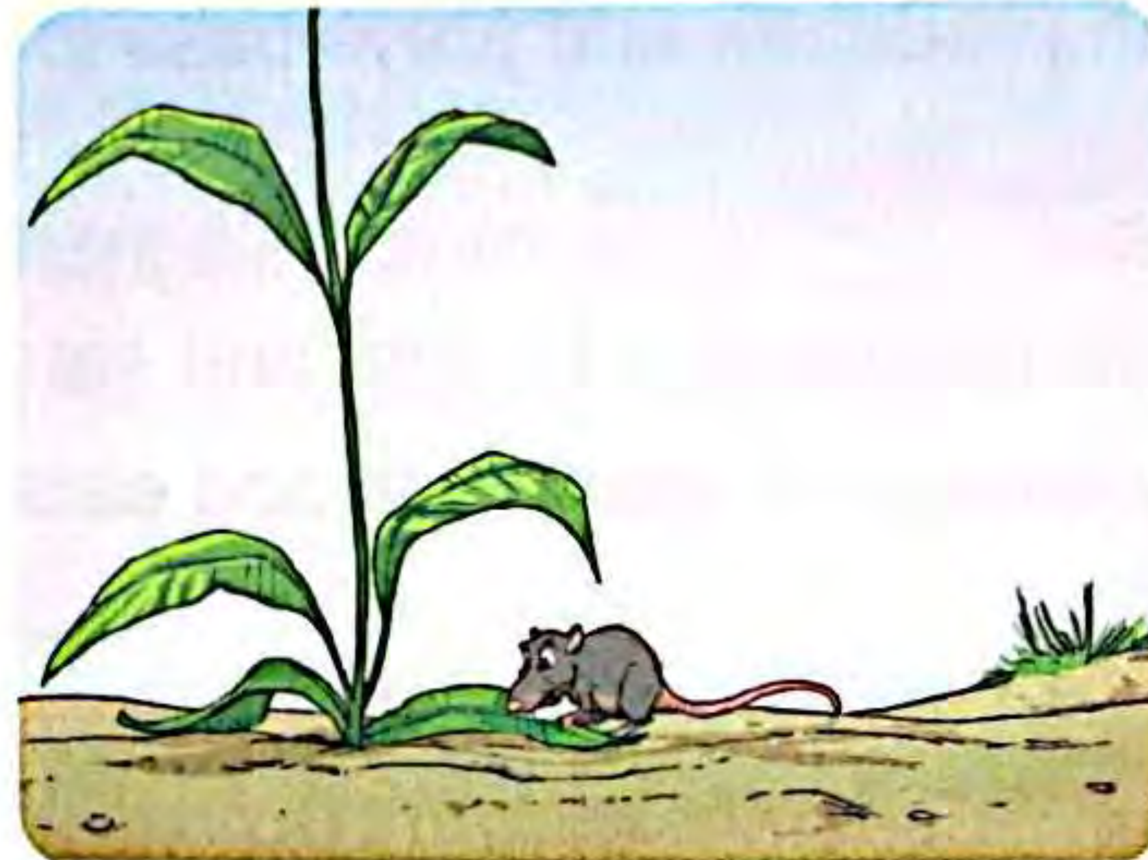
- As you know that all organisms need energy to do their activities and this energy flows through an ecosystem.
- There are organisms that cannot get energy directly from the Sun, so they obtain their needed energy by eating other living organisms.
- You also learned that food chain shows the food relationships (energy relationships) among organisms in different ecosystems.

### Example of a food chain

1. A green plant makes its own food using energy from sunlight.



2. A mouse eats the green plant to get energy.



3. Then a snake eats the mouse to get energy.



4. Then a hawk eats the snake to get energy.



**So,** we can form a food chain that shows the relationship among the previous living organisms as follows :









**Green plant** → eaten by → **Mouse** → eaten by → **Snake** → eaten by → **Hawk**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| activities | أنشطة | sunlight | ضوء الشمس | obtain | تحصل على | directly | مباشرة |

**From the previous explanation, we can conclude that :**

- The energy from the Sun passes to the green plant, then to the mouse and snake then finally to the hawk.
- Green plant can make its own food using the sunlight, while animals like mouse, snake and hawk cannot.

## Predator and prey

**In the previous food chain, we can observe that :**

- The hawk and the snake are "predators", because they hunt other animals.
- The snake and the mouse are "preys", because they are hunted by other animals for food.

**So,** both predators and preys pass food and energy through the food chain.



**Notes**

1. Any animal that is hunted and eaten by another animal is called **"prey"**.
2. Any consumer that hunts and eats another animal is called **"predator"**.



## Check your understanding

**Put (✓) or (✗) :**

1. Any animal that is hunted and eaten by another animal is called predator. ( )
2. In any food chain, the plant is considered as a prey. ( )
3. The energy from the Sun passes to the mouse directly. ( )

**In the Assessment Book :**
**Try to answer :**
Self-Assessment (7)



| | | | |
|---|---|---|---|
| pass to | يمر إلى | explanation | شرح |

# Exercises on Lesson 2

● Understand ○ Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. Living organisms that can absorb sunlight to make their own food are ..........
   a. animals only. b. plants only.
   c. humans and plants. d. animals and plants.
2. We need more energy during ..........
   a. watching TV. b. sleeping.
   c. listening to music. d. doing exercises.
3. Plants can make their own food through .......... process. *(Alex. 2023)*
   a. breathing b. photosynthesis
   c. digestion d. reproduction
4. Leaves of green plants absorb the sunlight to combine water with .......... to produce their own food. *(Giza 2023)*
   a. oxygen gas b. soil
   c. carbon dioxide gas d. roots
5. The primary source of energy for all living organisms on the Earth is ..........
   a. the Sun. b. green plants.
   c. glucose sugar. d. photosynthesis process.
6. All the following sentences are correct about photosynthesis, <u>except</u> ..........
   a. it depends on sunlight.
   b. it produces glucose sugar and carbon dioxide gas.
   c. it produces glucose sugar and oxygen gas.
   d. it occurs in plant leaves.
7. According to the way of feeding, living organisms are classified into ..........
   a. two groups. b. three groups. c. four groups. d. five groups.
8. .......... need energy to survive.
   a. Consumers only
   b. Decomposers only
   c. Consumers and decomposers only
   d. Producers, consumers and decomposers
9. Photosynthesis process produces ..........
   a. glucose sugar in consumers. b. glucose sugar in producers.
   c. water in consumers. d. water in decomposers.

10. Which of the following living organisms can make their own food ? ..........
    a. Hawks. b. Mice. c. Pine trees. d. Caracals.
    *(Cairo 2023)*

11. Nearly all plants are considered as ..........
    a. consumer organisms. b. nonliving things.
    c. decomposer organisms. d. producer organisms.

12. To obtain energy to survive, ..........
    a. a producer eats a decomposer. b. a consumer eats a producer.
    c. a butterfly eats a hawk. d. a hawk eats a butterfly.

13. Living organisms that cannot make their own food are ..........
    a. animals and plants. b. decomposers and producers.
    c. consumers and decomposers. d. consumers and producers.

14. Many insects are considered as ..........
    a. producers. b. decomposers.
    c. primary consumers. d. secondary consumers.

15. The energy can flow directly ..........
    a. from a plant to an eagle. b. from an ant to an eagle.
    c. from a snake to an eagle. d. from an eagle to a snake.

16. Which of the following food chains shows the correct way of energy flow through consumers ? ..........
    a. Secondary consumer → primary consumer → tertiary consumer.
    b. Primary consumer → secondary consumer → tertiary consumer.
    c. Tertiary consumer → secondary consumer → primary consumer.
    d. Secondary consumer → tertiary consumer → primary consumer.

17. All the following organisms are consumers, except ..........
    a. deers. b. crocodiles. c. rabbits. d. millipedes.

18. Any food chain starts with .......... *(Cairo 2023)*
    a. insects. b. plants. c. fungi. d. bacteria.

19. Decomposers always .......... the soil. *(Damietta 2023)*
    a. pollute b. damage c. benefit d. harm

20. Waste materials produced from millipedes and worms are rich in ..........
    a. water. b. nutrients. c. oxygen gas. d. carbon dioxide gas.

21. .......... are living organisms that can make their food directly from the light energy of the Sun.

a. Worms  b. Grasses only  c. Trees only  d. Grasses and trees

## 2 Choose from column (B) what suits it in column (A) :

| (A) | (B) |
|---|---|
| 1. Photosynthesis process<br>2. Respiration process<br>3. Decomposition process | a. it produces nutrients which are important for soil fertility.<br>b. it produces light which is important for plants.<br>c. it produces oxygen gas which is important for breathing.<br>d. it produces carbon dioxide gas which is important for plants. |

1. ................  2. ................  3. ................

## 3 Put (✓) or (X) :

1. There are some activities that don't need energy like listening to music. ( )
2. Butterfly can produce its own food from sunlight. ( )
3. Hard works or severe exercises need a lot of energy. ( )
4. Producers don't need consumers to survive. ( )
5. All living organisms don't need energy to survive. *(Giza 2023)* ( )
6. Glucose sugar that is produced by producers has a low amount of energy. ( )
7. Some producers can live in hot sunny weather, but they cannot live in a completely dark room. ( )
8. Producers and consumers use carbon dioxide gas for making their food. ( ) *(Giza 2023)*
9. Birds are secondary consumers, because they eat insects that feed on plants. ( )
10. Eagle is a tertiary consumer, where it is a large meat-eating animal. ( )
11. The first link in any food chain is a consumer. *(Giza 2023)* ( )
12. Consumers depend on the Sun indirectly to get their food. ( )
13. Recycling nutrients back to the ecosystem is the main function of the consumers. *(Gharbia 2023)* ( )
14. The predator is a consumer that eats another animal. ( )

## 4 Write the scientific term of each of the following :

1. The process that takes place inside plants through which we can get oxygen. (....................)
2. It is the primary source of energy for all living organisms on the Earth. (....................)
3. A type of living organisms that can produce its own food by absorbing sunlight. (....................)
4. The sugar that is formed inside plants during photosynthesis process. (....................)
5. The gas that is present in air and necessary for the formation of plant food. *(Ismailia 2023)* (....................)
6. The gas that is produced from photosynthesis process. (....................) *(Damietta 2023)*
7. Living organisms that both humans and animals need to survive. (....................)
8. A group of living organisms that can live on decaying dead organisms. *(Cairo 2023)* (....................)
9. It is a process through which decomposers can recycle nutrients back into the soil. (....................)
10. It is a model that shows how energy flows from one organism to another in an ecosystem. (....................)
11. The animal that is eaten by another animal. (....................)
12. The consumer that hunts and eats another animal. (....................)

## 5 Complete the following sentences :

1. All living organisms need .................. to do their activities and to carry out their life processes.
2. Sunlight energy converts .................. and .................. into glucose inside the plant leaves.
3. Both humans and animals cannot produce their own ..................
4. Plants produce .................. and .................. during photosynthesis process. *(Cairo 2023)*
5. Living organisms include .................., consumers and decomposers.
6. Decomposers and .................. depend on producers to get their energy.
7. The most common producers are ..................
8. The light energy of the Sun cannot flow directly to consumers and ..................

9. In a food chain, the energy flows from a ................ consumer to a secondary consumer.

10. Decomposers are responsible for ................ nutrients to the soil, that are needed for plants growth.

## 6 Give reasons for :

1. Human needs to eat some animals and plants.

........................................................................................................

2. Sunlight is important for all living organisms. *(Damietta 2023)*

........................................................................................................

3. Consumers depend on producers to get their energy.

........................................................................................................

........................................................................................................

4. Soil fertility depends on decomposers.

........................................................................................................

........................................................................................................

## 7 What happens if ... ?

1. There is no sunlight reaches the Earth's surface.

........................................................................................................

2. All primary consumers disappear from a certain food chain. *(Giza 2023)*

........................................................................................................

3. All types of decomposers are absent from an ecosystem.

........................................................................................................

## 8 Form the following food chain by using the words between brackets, then complete the sentences below :

(Duck – Grasses – Fox)

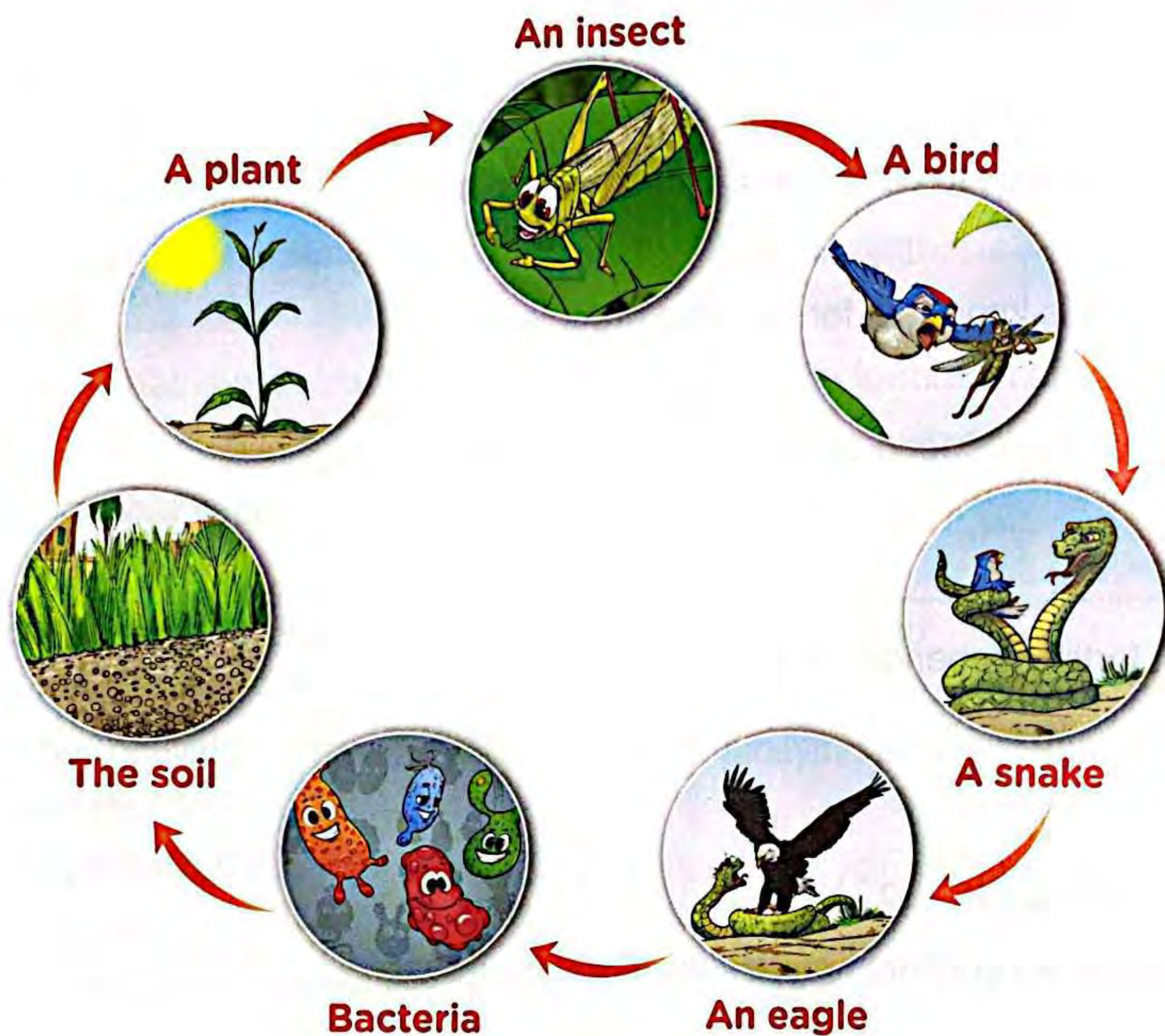



a. This food chain doesn't contain .................. consumer.

b. The group of living organisms that is responsible for the final link of this food chain is ..................

c. Grasses use .................. energy of the Sun during .................. process.

**9** **Study the following figure that shows how nutrients are recycled back into the soil, then complete the sentences below :**




1. Photosynthesis process is done by .................... , so it is a producer.
2. Decomposition process is done by .................... , so they are decomposers.
3. The insect is a .................... consumer, because it eats the plant.
4. The large meat-eating animal is the ....................
5. When the eagle dies, its nutrients return back to the .................... with the help of bacteria.

## Activity 7 Food Chain

You have learned that food chain is a model that shows the flow of energy among living organisms in an ecosystem.

**Now,** let's make a model of a food chain.

▶ **Complete the following food chain model using these words :**

**(Bird – Grass – Snake – Hawk)**






**Give a reason for :**

**Some living organisms obtain their needed energy by eating other living organisms.**

Because they cannot get energy directly from the Sun.

## Check your understanding

▶ **Look at the following food chain, then put (✓) or (×) :**







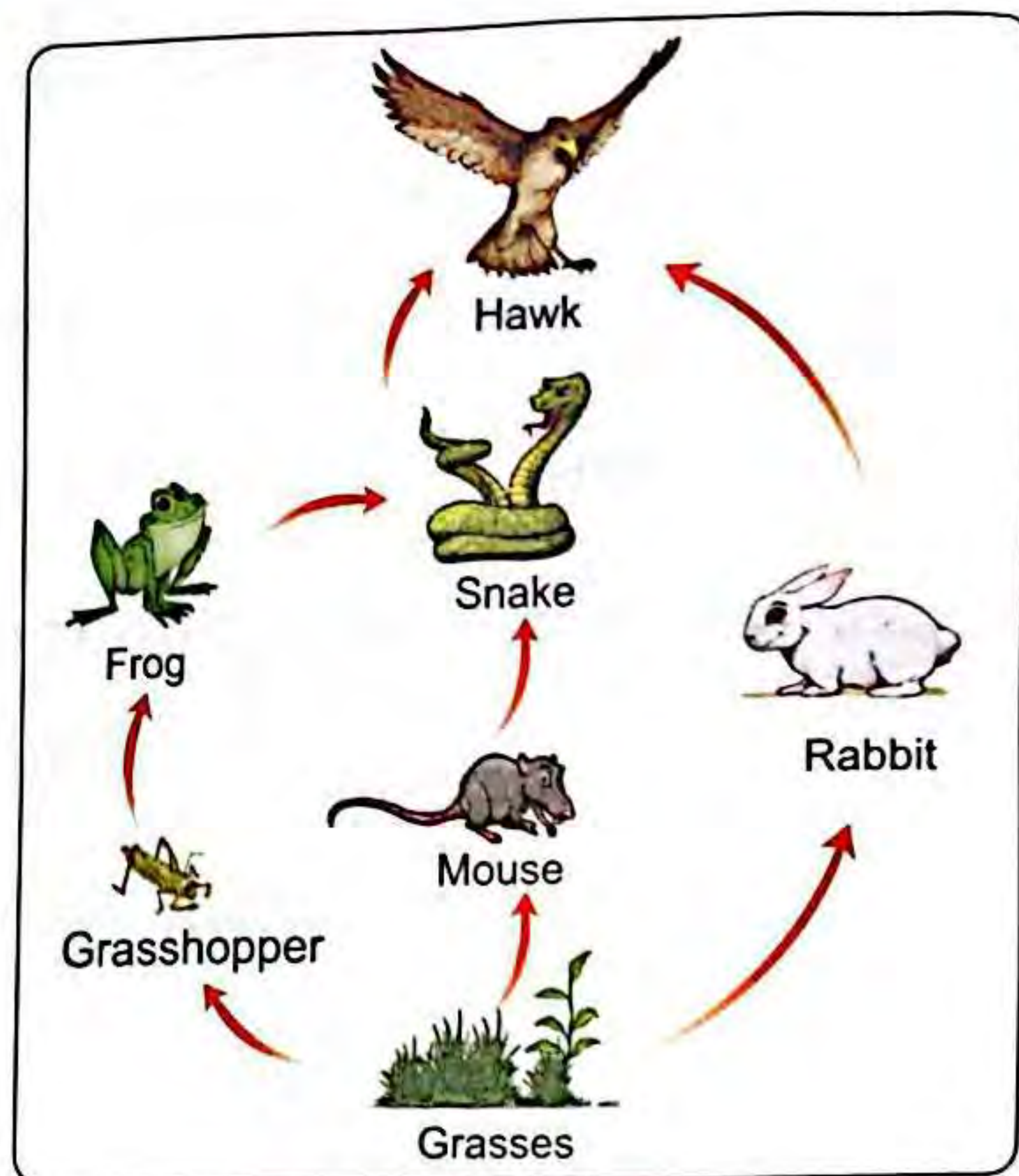
**Grass** → **Beetle** → **Frog** → **Snake** → **Hawk**

1. Beetle is considered as a producer living organism. (  )
2. Frog is eaten by the snake. (  )
3. Hawk is a predator living organism. (  )
4. Frog is considered as a tertiary consumer. (  )

model نموذج | grasshopper جراد | beetle خنفساء

# Activity 8 Food Webs

All living organisms interact in food webs and we can draw these webs to show how organisms are connected within ecosystem.



Food web

**Food web :**

It is a model that shows several interconnected food chains among living organisms.

## Interconnected food chains

- We know food chains show the relationship of food and energy that passes from one organism to another, where :
  - As you have studied, the Sun provides energy for producers such as plants to make their own food during photosynthesis process.
  - Then, plants provide food for a series of consumers which may eat only plants or eat both plants and animals.
- **So,** the ways in which many food chains interact within an ecosystem form a food web.



## Check your understanding

▶ **Classify the following organisms in the table below :**

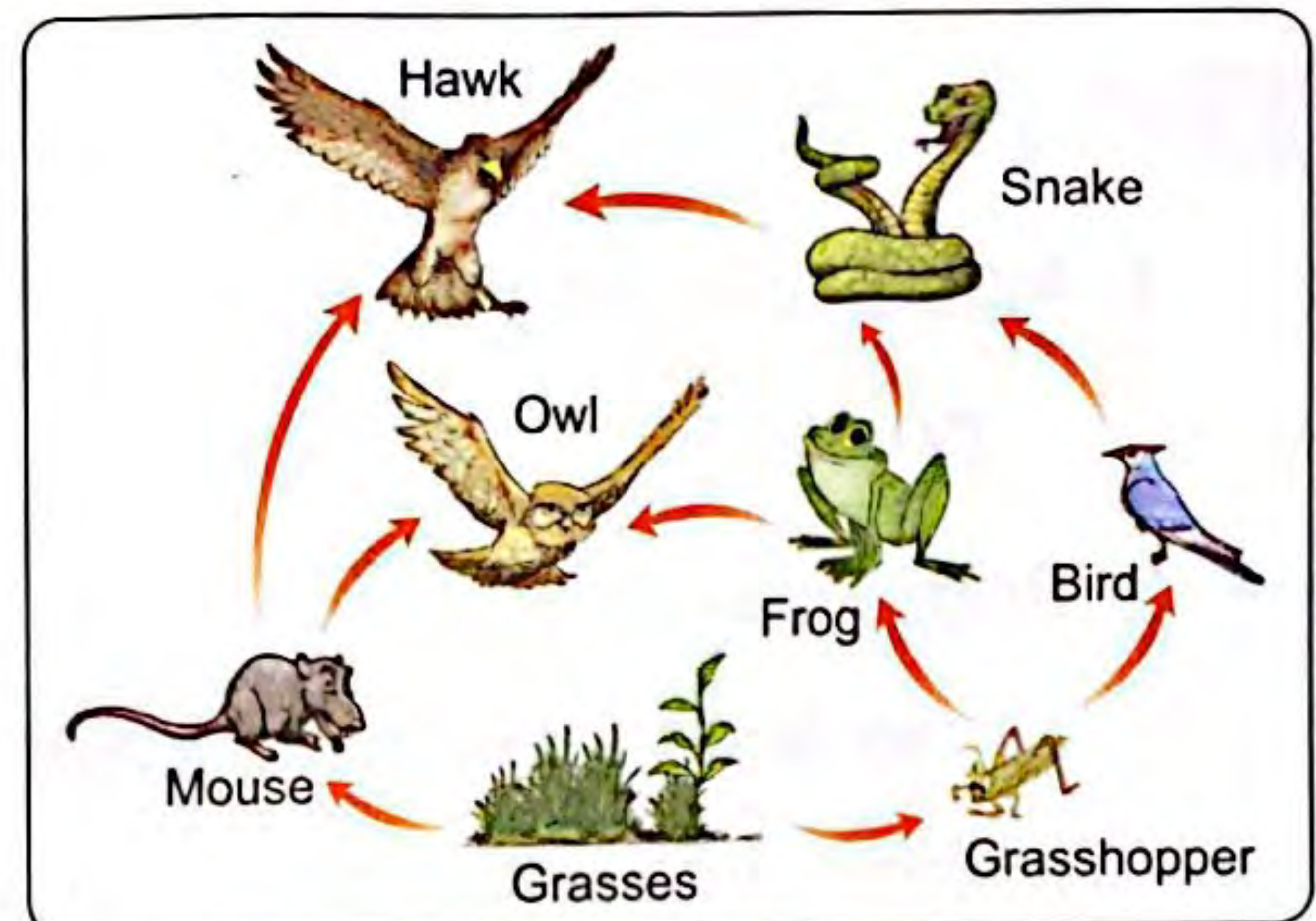
**(Hawks – Grasses – Insects – Trees – Alligators – Mice)**

| Producers | Predators | Prey |
|---|---|---|
| .................................... | .................................... | .................................... |
| .................................... | .................................... | .................................... |
| .................................... | .................................... | .................................... |



| series | سلسلة | interact | تفاعل | form | يكوّن | interconnected | مترابط |
|---|---|---|---|---|---|---|---|

## Activity 9 Interactions in Food Webs




- **From the opposite food web, we notice that :**
  - Food web shows that many different organisms share food resources within ecosystem.
  - Several different consumers may eat the same producer or prey.

- **Food webs show that different organisms in an ecosystem are connected to allow energy to pass between them to survive, where :**
  - Producers are eaten by some consumers.
  - Some consumers are eaten by other consumers.
  - Some consumers may eat the same producer or prey.

### ? Give a reason for :

**It is better to use a food web to show interactions among living organisms than a food chain.**

Because a food web shows interactions among many food chains so, the food web contains many organisms, while a food chain shows interactions between just few organisms.



### Check your understanding

- **Put (✓) or (✗) :**

1. Food webs show that many different organisms share food resources within ecosystems. ( )
2. Food chains show interactions among many food webs. ( )

**In the Assessment Book :**
**Try to answer :**
Self-Assessment (8)

# Exercises on Lesson 3

● Understand ● Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. All the following are types of food for primary consumers, except ..........
   a. grasses. b. seeds. c. fruits. d. eagles.

2. Both animals and humans bodies ..........
   a. can absorb sunlight to make their own food.
   b. cannot absorb sunlight to make their own food.
   c. breathe carbon dioxide gas.
   d. don't need water to drink.

3. A hawk can eat .........., when snakes are completely disappear from an ecosystem.
   a. grasses b. grasshoppers c. mice d. leaves

4. It is better for any predator to depend on .......... to get its energy and survive.
   a. one species of consumers only b. many species of consumers
   c. one species of decomposers only d. many species of decomposers

5. All types of plants are similar in all the following characters, except they ..........
   a. are able to make photosynthesis process.
   b. are eaten by primary consumers.
   c. can feed on predators.
   d. live in different types of ecosystems.

6. Human is a .......... living organism.
   a. producer b. consumer c. decomposer d. predator

7. Secondary consumers can eat only .......... *(Cairo 2023)*
   a. decomposers. b. producers.
   c. primary consumers. d. tertiary consumers.

8. Food web shows interactions between .......... *(Fayoum 2023)*
   a. few nonliving things. b. many nonliving things.
   c. few living organisms. d. many living organisms.

9. In a food chain, there is a .......... found between a producer and a secondary consumer.
   a. decomposer b. predator
   c. primary consumer d. tertiary consumer

## 2 Put (✓) or (✗) :

1. A hawk can get directly its needed energy by eating beetles. *(Alex. 2023)* ( )
2. There are some consumers that can eat both plants and animals. ( )
3. In a food chain, the energy can pass from a producer to a nonliving thing then to a primary consumer. ( )
4. Hawks, alligators and sharks are predators. ( )
5. Human can eat plants and animals. *(Cairo 2023)* ( )
6. Food web is the interconnected food chains that shows many different feeding relationships. *(Gharbia 2023)* ( )
7. All living organisms depend on each other to get energy. ( )

## 3 Complete the following sentences by using the words between brackets :

**(primary consumers – producers – food web – secondary consumer)**

1. The interaction among many food chains is known as ..................
2. In any food chain, plants are considered as .................. *(Suez 2023)*
3. If a frog eats an insect that feeds on plants, this means that the frog is a ..................
4. Humans can eat producers and .................. *(Cairo 2023)*

## 4 Study the following food web, then choose the correct answer :




1. When ........... disappear from this food web, birds are moving away to search for food in another ecosystem.
   a. butterflies only
   b. worms only
   c. grasshoppers only
   d. primary consumers
2. Grasshoppers may die when there is no ...........
   a. birds.
   b. snakes.
   c. plants.
   d. butterflies.

# LESSON FOUR

## Activity 10 Record Evidence like A Scientist

- In this concept, you have learned a lot about energy flow through an ecosystem, food chains and food webs.
- **Now,** try to think like a scientist by writing your claim, your evidence and your scientific explanation about one of the main points of this concept through the four steps you have learned in concept one.

### Step 1 The Question

How does energy flow through an ecosystem ?

### Step 2 My Claim

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### Step 3 My Evidence

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### Step 4 My Scientific Explanation

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| | | | | | |
|---|---|---|---|---|---|
| claim | فرضية | evidence | دليل | scientific explanation | تفسير علمى |

## Activity 11 STEM in Action

▸ **In this activity,** we will talk about Dr. Becky Barak who is a plant-community ecologist.

### Dr. Becky Barak



- She is a plant-community ecologist, which means she studies groups of plants and gets to do her researches out in the natural areas where plants and animals exist.
- She always loved plants and animals since her childhood, but she did not know that there was a science through which she can study plants and animals.
- She started to learn about ecology, then she studied a class in restoration ecology which means "rebuilding habitats that are damaged".

### Seed Dispersal

*** Dr. Becky Barak has learned many interesting things such as :**

- Different plants need different ways to transport (disperse) their seeds.
- There are plants with sticky seeds that stick to human clothes or an animal's body, so human or animal can carry these seeds to another place where seeds fall down.
- Other plants have light seeds that are dispersed by wind, these seeds are carried away by winds to new habitats to grow in other places.

### Careers in ecology

- If you are interested in the natural world, you can share in conservation or restoration work in your area to help take care of plants and animals.
- Your interest in nature now could lead to a career in ecology in the future.



### Check your understanding

▸ **Put (✓) or (✗) :**

1. Dr. Becky Barak does her research in the lab. ( )
2. Different plants need different ways to transport their seeds. ( )

### Review on Concept (1 - 2)

To review this concept look at the **Assessment Book** "Part 2 : Final Revision".

**In the Assessment Book :**
**Try to answer :**
- Self-Assessment (9)
- Model Exam on Concepts (1.1) & (1.2)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| restoration ecology | علم الترميم البيئى | ecology | علم البيئة | disperse | ينثر / ينشر | careers | وظائف |
| ecologist | عالم البيئة | research | بحث | sticky | لزج | light | خفيفة |
| plant-community | مجتمع النبات | habitats | بيئات | | | | |

# Exercises on Lesson 4

Understand Apply Higher Thinking Skills

## 1 Choose the correct answer :

1. Restoration ecology means ..........
   a. damaging the rebuilt habitats.
   b. rebuilding habitats that are damaged.
   c. throwing plastic products in seas.
   d. throwing plastic products in deserts.
2. All the following ways help plants to disperse their seeds, except ..........
   a. water. b. air.
   c. animal bodies. d. sunlight. *(Qalyoubia 2023)*
3. Plants with sticky seeds need .......... to stick to, then disperse and grow in a new habitat.
   a. air b. water
   c. light energy from the Sun d. body of a living organism
4. Wind play an important role in dispersing .......... seeds. *(Cairo 2023)*
   a. small light b. big heavy
   c. sticky d. floating

---

## 2 Put (✓) or (X) :

1. Ecologists should do their researches in natural areas that contain animals and plants. ( )
2. Rebuilding habitats that are damaged is known as restoration ecology. ( )
3. All plants need the same way to disperse their seeds. *(Giza 2023)* ( )
4. Both of small light seeds and big heavy seeds can disperse by wind. ( )

---

## 3 Give reasons for :

Sticky seeds of some plants can stick to human clothes or an animal's body.

..........................................................................................

..........................................................................................

# Model Exam 1

## on Concept (1.2)

Total mark

15

**1** **(A) Choose the correct answer :** *( 5 marks)*

1. Hawk eats a rabbit to get energy, this means that ..........
   a. hawk and rabbit are predators. b. the hawk is a predator.
   c. the hawk is a prey. d. the rabbit is a predator.

2. Photosynthesis process produces ..........
   a. glucose sugar in the producers. b. glucose sugar in the consumers.
   c. water in decomposers. d. water in consumers.

3. All types of plants are similar in all the following characters, except ..........
   a. they are eaten by primary consumers.
   b. they are able to make photosynthesis process.
   c. they live in different types of ecosystems.
   d. they can feed on predators.

4. Which of the following food chains shows the correct way of energy flow through living organisms ? ..........
   a. Producer ⟶ predator ⟶ primary consumer.
   b. Predator ⟶ producer ⟶ secondary consumer.
   c. Producer ⟶ primary consumer ⟶ predator.
   d. Producer ⟶ secondary consumer ⟶ predator.

**(B) What happens if ...?**

All types of decomposers are absent from an ecosystem.

..........................................................................................

..........................................................................................

---

**2** **(A) Put (✓) or (✗) :** *( 5 marks)*

1. All plants need the same way to disperse their seeds. ( )
2. Food web shows interaction between few living organisms. ( )
3. The first link in any food chain is a consumer. ( )
4. Hawks, alligators and sharks are considered as predators. ( )

### (B) Give a reason for the following :

Some living organisms obtain their needed energy by eating other living organisms.

..................................................................................................................................................

..................................................................................................................................................

### 3 (A) Complete the following sentences : *(5 marks)*

1. All living organisms need .................. to do their activities and to carry out their life processes.
2. Plants produce .................. and .................. during photosynthesis process.
3. In a food chain, the energy flows from a .................. consumer to a secondary consumer.
4. An area that provides food, water and shelter to all living organisms which live in it, is known as ..................

### (B) The following figure shows an energy flow through a food chain :

Producer → Animal (A) → Animal (B)

Which of the following is correct about this food chain ? ..........

a. Animal (A) is a predator.
b. Animal (A) is a secondary consumer.
c. Animal (B) is a tertiary consumer.
d. Animal (B) is a predator.

# Model Exam 2

## on Concept (1.2)

Total mark
15

**1** **(A) Choose the correct answer :** *(5 marks)*

1. The .......... energy that comes from the Sun is important for the photosynthesis process.
   a. sound b. light c. kinetic d. potential
2. Plants with sticky seeds need .......... to stick to disperse and grow in a new habitat.
   a. light energy from the Sun b. body of a living organism
   c. air d. water
3. Which one of the following living organisms can make its own food ? ..........
   a. Grass. b. A worm. c. A bird. d. A rodent.
4. Waste materials produced from millipedes and worms are rich in ..........
   a. oxygen gas. b. carbon dioxide gas.
   c. water. d. nutrients.

**(B) Give a reason for the following :**

Consumers depend on producers to get their energy.

..........................................................................................

..........................................................................................

**2** **(A) Write the scientific term of each of the following :** *(5 marks)*

1. It is the primary source of energy for all living organisms on the Earth. (....................)
2. A group of living organisms that can produce their own food. (....................)
3. The animal that is eaten by another animal. (....................)
4. It is a model that shows how energy flows from one organism to another in an ecosystem. (....................)

**(B) Correct the underlined words :**

1. In any food chain, plants are considered as <u>consumers</u>. (....................)
2. If a frog eats an insect that feeds on plants, this means that the frog is a <u>primary</u> consumer. (....................)

**3** **(A) Choose from column (B) what suits it in column (A) :** *(5 marks)*

| (A) | (B) |
|---|---|
| 1. Carbon dioxide gas<br>2. Oxygen gas<br>3. Water<br>4. Sunlight | a. without its energy, photosynthesis process cannot begin.<br>b. it combines with oxygen inside the plant leaves to produce glucose sugar.<br>c. it is produced from photosynthesis process.<br>d. it is absorbed by plant roots from the soil.<br>e. it combines with water inside the plant leaves to produce glucose sugar. |

1. ................. 2. ................. 3. ................. 4. .................

**(B) What happens if ... ?**

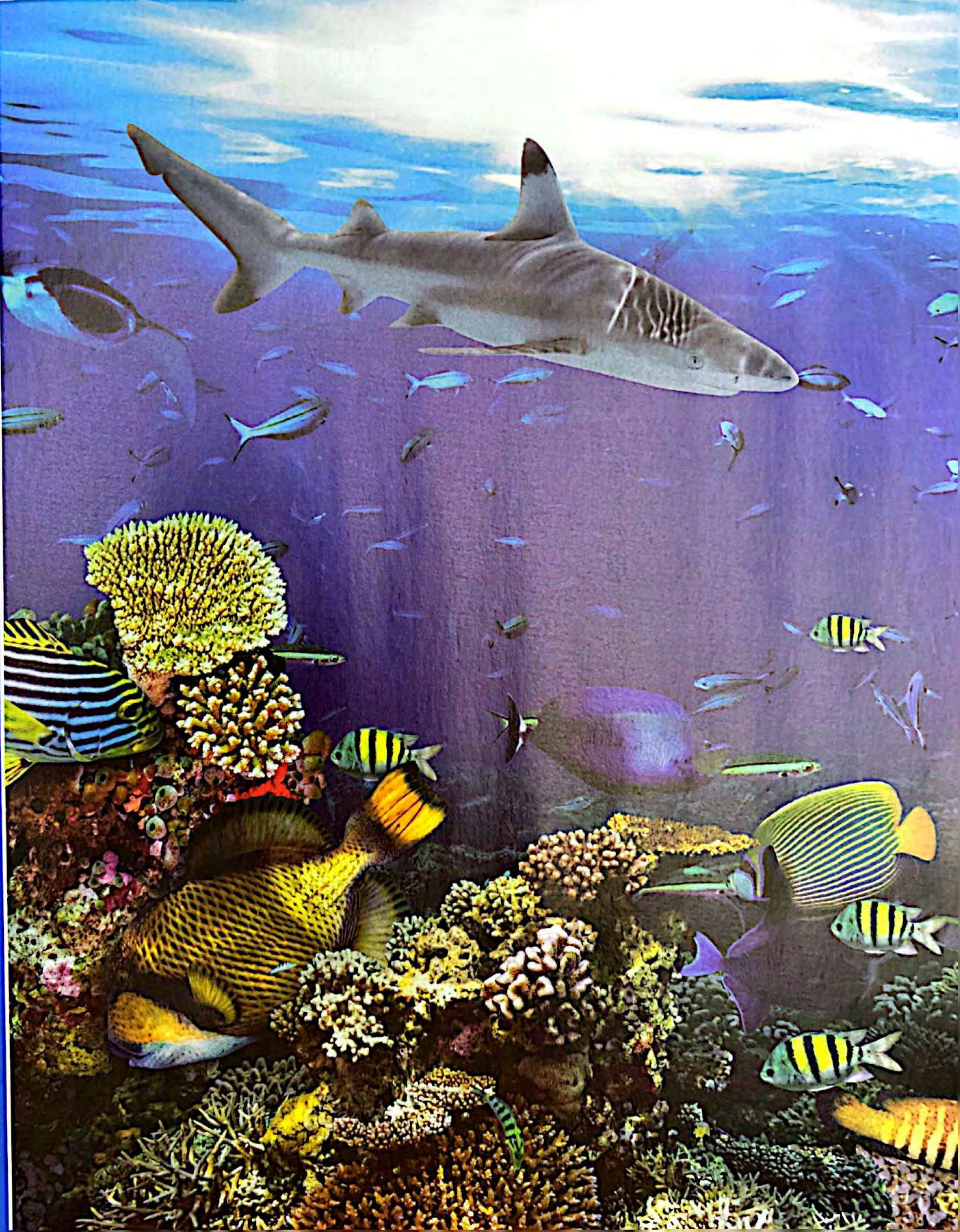
There is no sunlight reaches the Earth's surface.

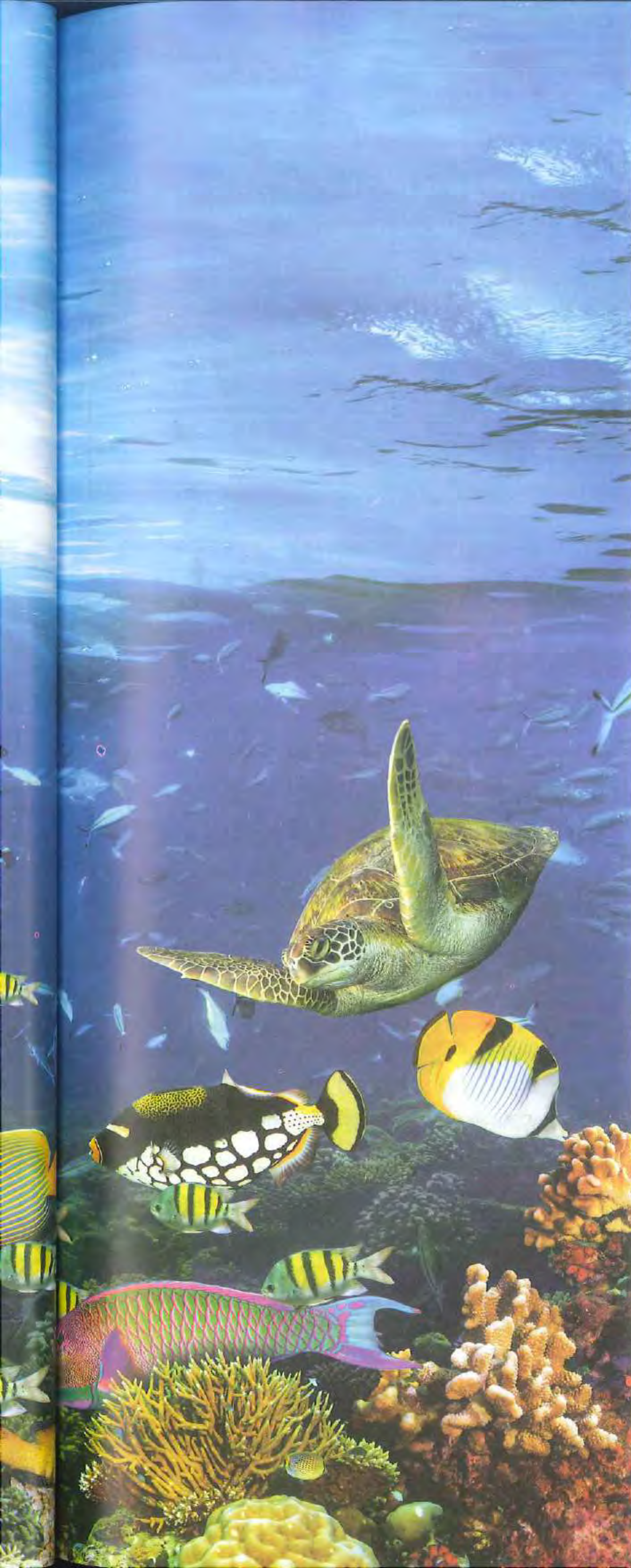
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Concept

# 1.3 Changes in Food Webs





## Learning outcomes

### By the end of this concept, your child will be able to :

- Demonstrate through modeling how changes in an ecosystem can disrupt a food web.
- Construct an explanation about how human activity can negatively impact an ecosystem.
- Argue for possible solutions to environmental problems that can restore the health of an ecosystem.

## Key vocabulary

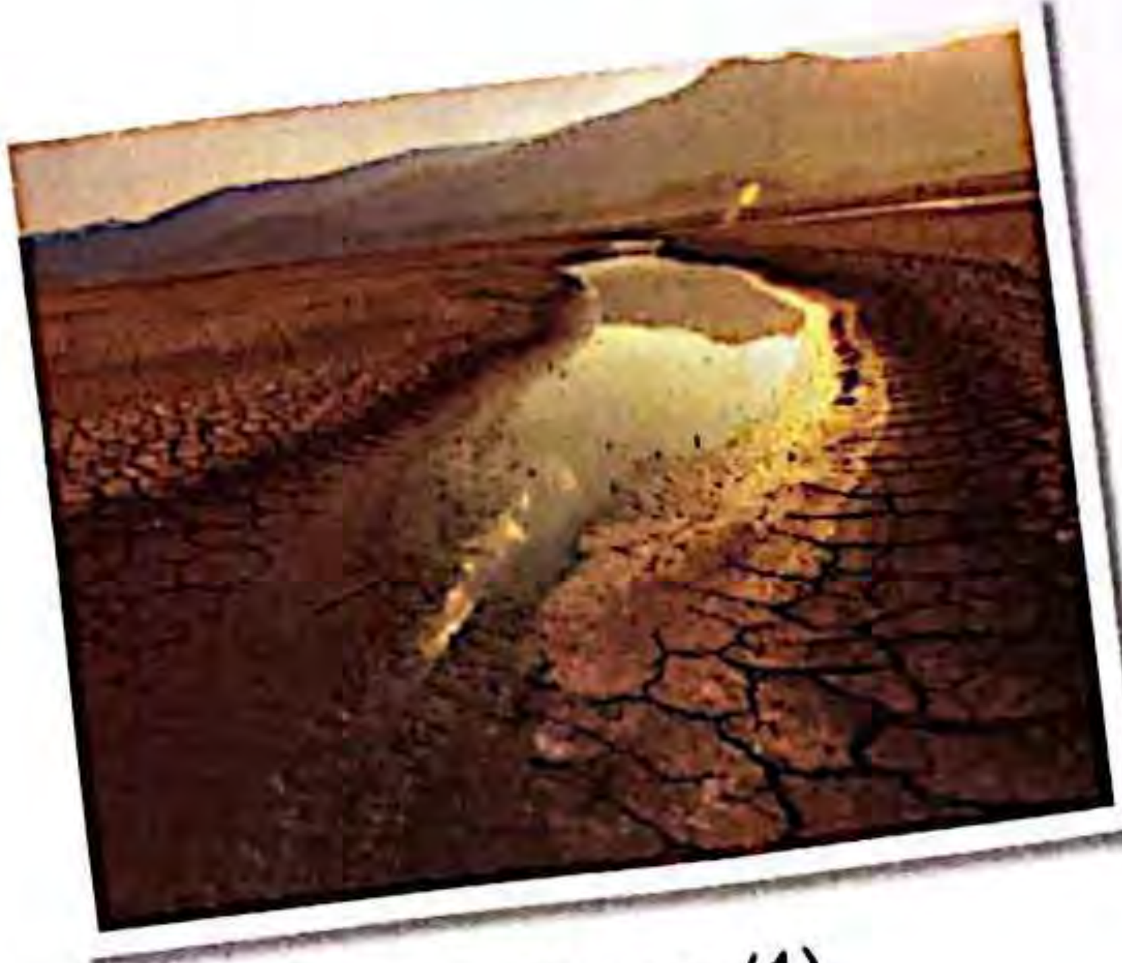
- Climate
- Conservation
- Nursery
- Pollution
- Habitat
- Population
- Microorganisms
- Restoration
- Microplastics

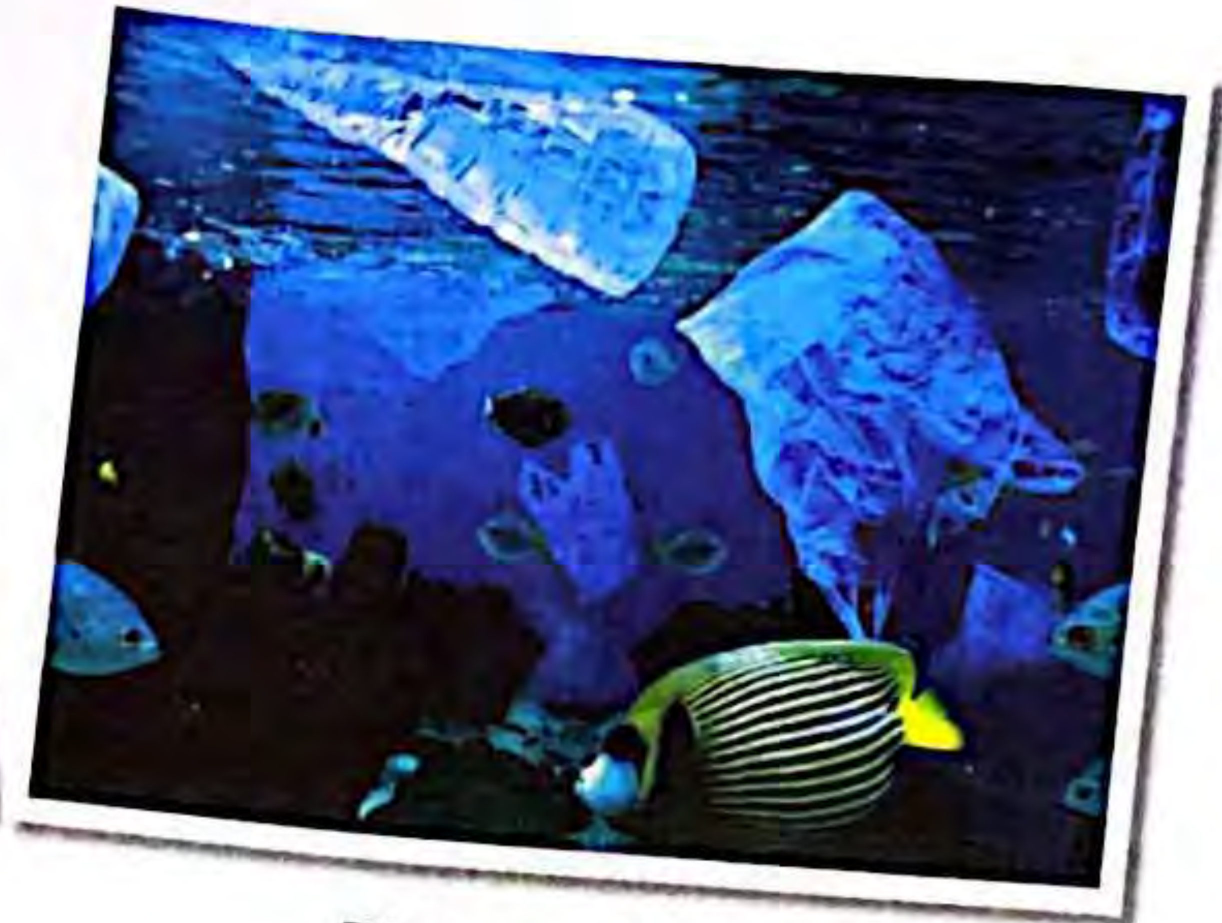
# Notes For Parents On Concept [1.3]

| Lessons | Activities | What you should do with your child |
|---|---|---|
| 1 | Activity 1 | Discuss with your child what might happen to a food web when an organism or the environment changes within an ecosystem. |
| | Activity 2 | Explain to your child how we can protect the marine environment in Palau island. |
| | Activity 3 | Explain to your child how the change in ecosystem affects the food web. |
| 2 | Activity 4 | Discuss with your child how the energy transfers from the prey to the predator. |
| | Activity 5 | Discuss with your child the flow of energy in the desert food web. |
| | Activity 6 | Explain to your child how a population of one species affects the population of other species. |
| 3 | Activity 7 | Explain to your child why healthy habitats are important to all organisms in the food web. |
| | Activity 8 | Explain to your child the effect of plastic products on marine life. |
| 4 | Activity 9 | Help your child to think like a scientist by answering a question about one of the main points of this concept then write his/her claim, evidence and the scientific explanation. |
| | Activity 10 | Explain to your child how scientists, engineers and citizens work on habitat restoration. |

# LESSON ONE

## Activity 1 Can You Explain ?


Picture (1)


Picture (2)

▶ **From the previous pictures, we can notice that :**

- **In picture (1) :**
  - The water of the lake is evaporated due to the hot of the Sun.
  - The ground is dried around the lake due to the drought conditions.
- **In picture (2) :**
  The sea is polluted due to throwing of plastic garbage of some ships into the sea.

▶ **What might happen to a food web when an organism or the environment changes within an ecosystem ?**

**All organisms may be affected, where :**

- If producers (plants) were disappeared from an ecosystem, the consumers will need to move to other places to search for food or they will die.
- If the number of one species of consumers in an ecosystem increases, the resources of food and shelter may disappear, so they will die.

▶ **In this concept, we will study :**

- Protecting ecosystems.
- Population changes.
- Habitat loss.
- Plastic pollution.
- Habitat restoration.

| | | | | | |
|---|---|---|---|---|---|
| dried | جافة | ecosystem | نظام بيئى | drought conditions | ظروف الجفاف |
| food web | شبكة غذائية | evaporate | يتبخر | habitat loss | فقدان الموطن الطبيعى |
| plastic garbage | مخلفات بلاستيكية | population | مجموعات من الكائنات الحية | habitat restoration | إصلاح الموطن الطبيعى |

## Activity 2 Protecting Ecosystems

▸ **Put (✓) or (×) :**

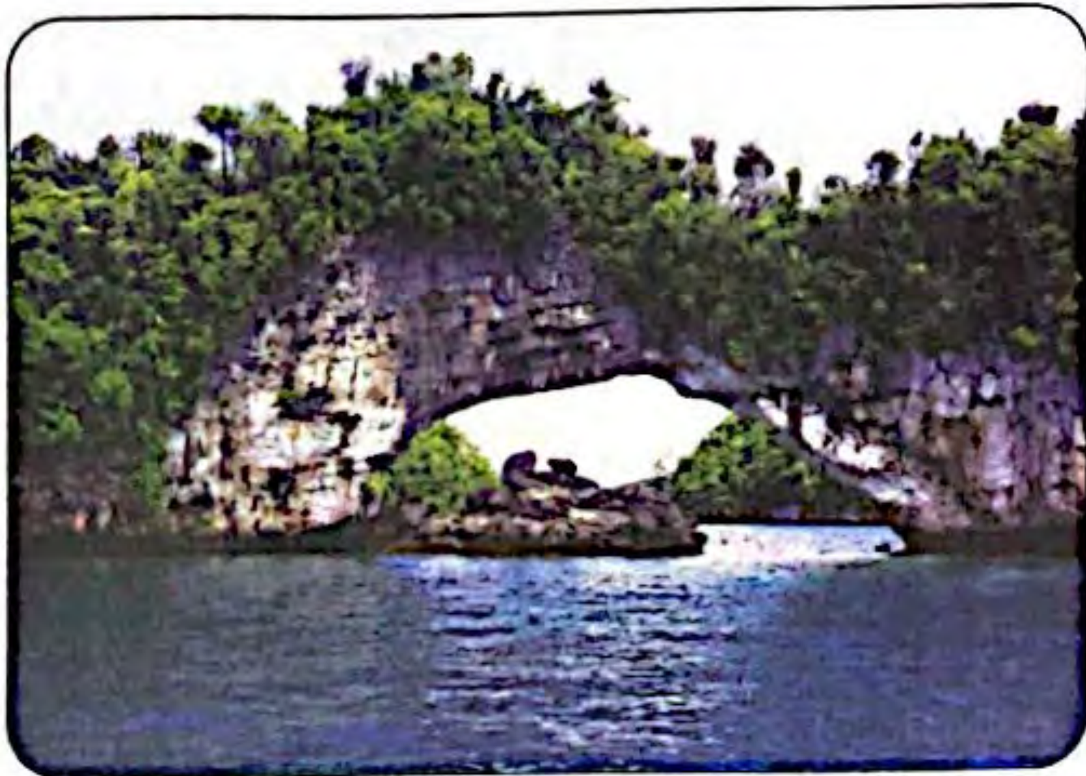
1. Human activities such as overfishing can affect marine habitats. ( )
2. Throwing plastic in seas affects the life of marine organisms. ( )

▸ **Human activities affect the marine habitats through :**

- **Overfishing** (when humans catch many fish from rivers, seas and oceans).
- **Water pollution** (when humans throw waste materials in rivers, seas and oceans).

### Protection of the marine environment in Palau Island

- On any island, we can observe that what is happening on land affects what is happening in the marine environment.



Palau island

- People in Palau uses different conservation programs to protect the marine environment and its resources by creating well-designed protected marine environment, where :
  - People in Palau control human activities on land to keep the protected marine environment from pollution by avoiding throwing waste materials into the ocean.
  - Fishermen must not overfish the coral reefs to conserve the marine environment.



### Check your understanding

▸ **Put (✓) or (×) :**

1. Water pollution cannot affect the marine habitats. ( )
2. People in Palau must control the human activities on land to protect the marine habitat from pollution. ( )

| | | | | | |
|---|---|---|---|---|---|
| protecting ecosystem | حماية الأنظمة البيئية | resources | مصادر | overfishing | الصيد الجائر |
| marine environment | بيئة بحرية | create | يُخلق | conservation programs | برامج الحفاظ |
| coral reefs | الشعاب المرجانية | | | | |

## Activity 3 What Do You Already Know About How Food Webs Can Change ?

- Relationship between all the components of an ecosystem play an important role in keeping this ecosystem balanced.
- **When an ecosystem changes, food webs in this ecosystem change too, as shown in the following cases :**

| What would happen if ... ? | Result | Reason |
|---|---|---|
| There is a gentle rain in the desert | The desert ecosystem may be improved. | Because rainwater will feed the plants (producers) which will feed the organisms. |
| There is a heavy rain in the desert | The desert ecosystem may be harmed. | Because the water of heavy rain will cause flooding which will destroy the ecosystem. |
| There is a drought and all the grass dies | The food web in the ecosystem may be destroyed. | Because the plants will die and also the organisms will die. |
| There are many top predators in the food web | The other organisms in the food web may be harmed. | Because the top predators will eat all the organisms. |

**Note**

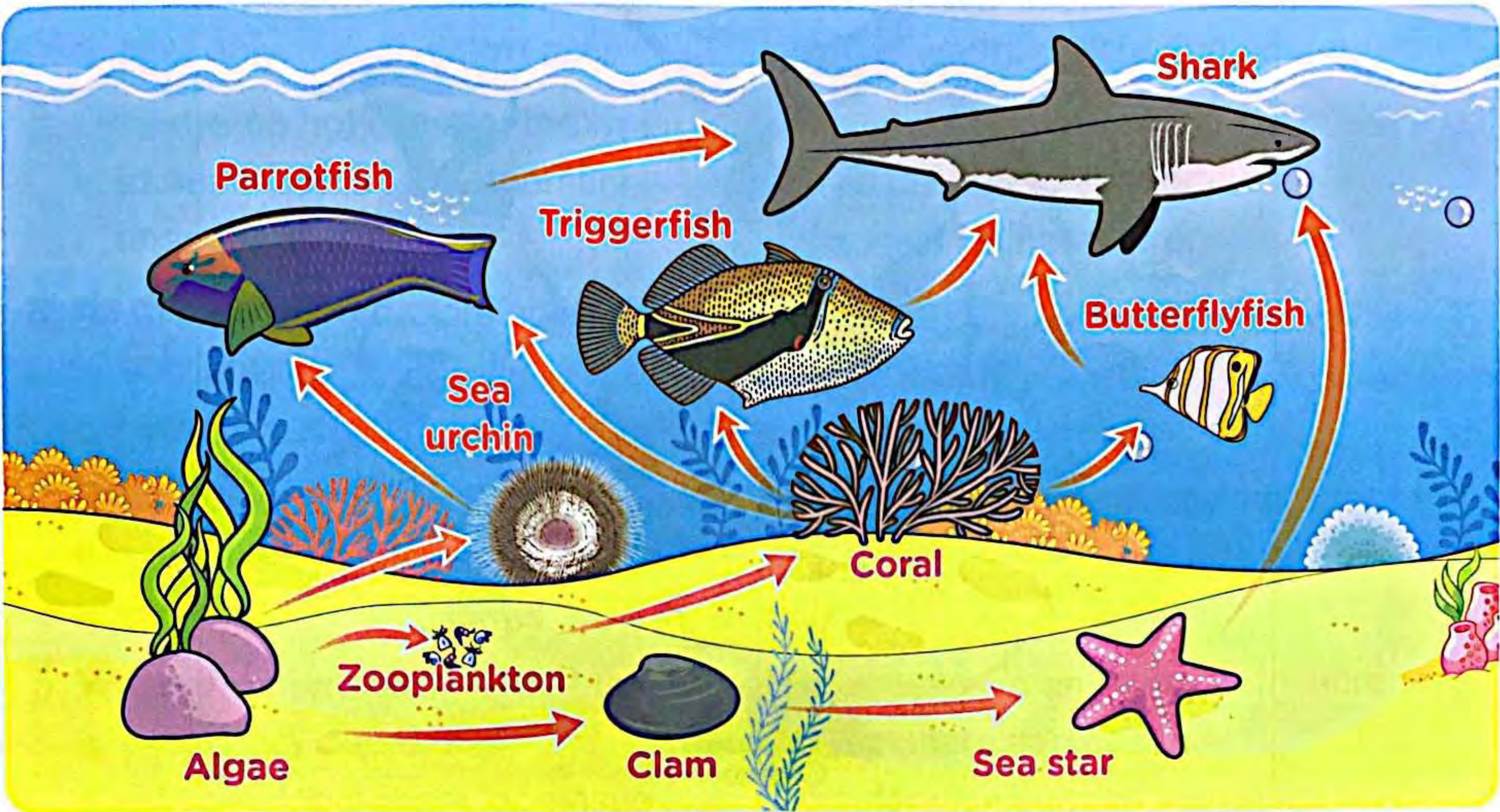
**Top predators :** They are predators (consumers) that exist at the top of food chains such as : Tigers, lions, sharks, crocodiles, ...etc.

| | | | | | |
|---|---|---|---|---|---|
| relationship | علاقة | destroy | يدمر | balance | توازن |
| gentle rain | أمطار خفيفة | remove | يُزيل | improve | يُحسن |
| heavy rain | أمطار غزيرة | flood | فيضان | top predators | الحيوانات المفترسة |
| exist | توجد | | | | |

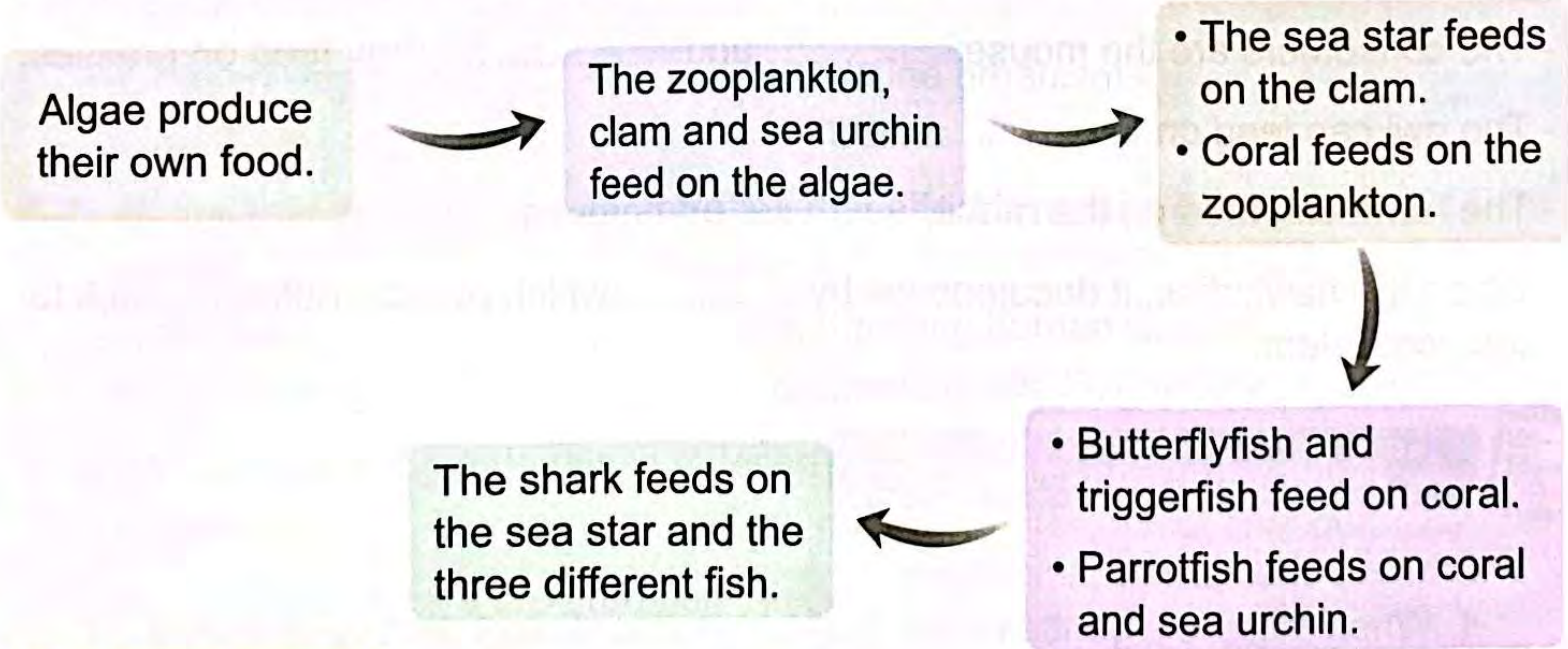
## Food webs

You have known from the previous concept that the food web is a model shows several interconnected food chains.

**▶ Look at this marine food web, then observe which organisms eat other organisms.**




**▶ From the previous marine food web, we observe that :**



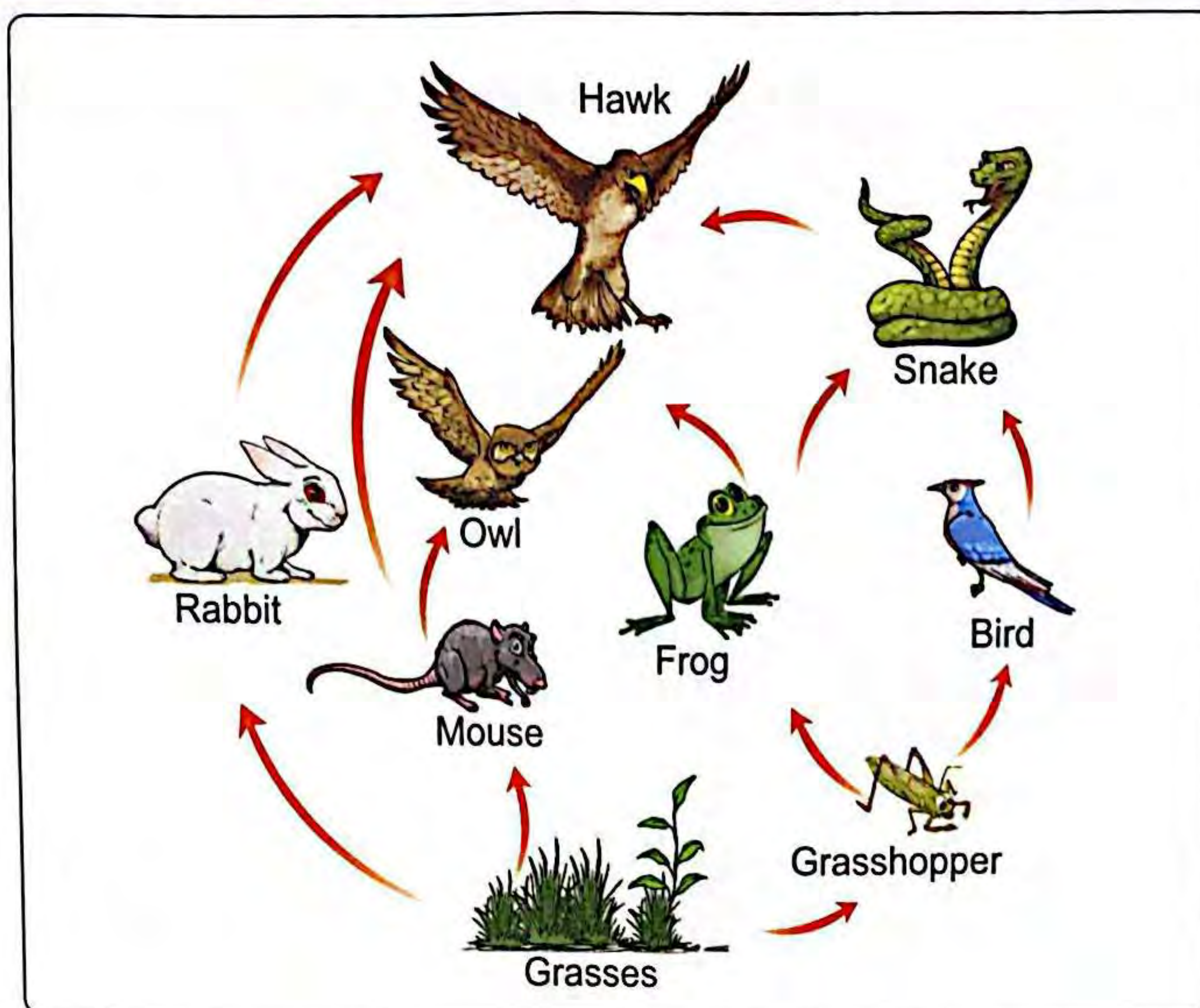

## My ecosystem

In an ecosystem the Sun produces energy that the plants take, then this energy transfers to consumers that when they die, the decomposers break them down into nutrients that can be returned to the ecosystem.

| | | | | | |
|---|---|---|---|---|---|
| marine food web | شبكة غذائية بحرية | parrotfish | السمكة الببغائية | sea urchin | قنفذ البحر |
| algae | طحالب | zooplankton | العوالق البحرية | butterflyfish | سمكة الفراشة |
| triggerfish | سمكة الزناد | feed on | يتغذى على | | |
| clam | الأصداف البحرية | | | | |

**▸ Look at the following food web, then complete the sentences below using these words :**

**(snake – grasses – bacteria – rabbit – frog – grasshopper – mouse)**




- The producer is the ..................... as they produce their own food.
- The consumers are the mouse, ..................... and ..................... as they feed on grasses.
- The owl can feed on the ..................... and .....................
- The hawk can feed on the rabbit, ..................... and mouse.
- When the hawk dies, it decomposes by ..................... which recycle nutrients back to the ecosystem.



## Check your understanding

**▸ Choose the correct answer :**

**1.** When there is a gentle rain in the desert , the desert escosystem may be .....................

a. harmed. b. destroyed. c. improved. d. polluted.

**2.** Algae are considered .....................

a. consumers. b. producers. c. decomposers. d. dead creatures.

**In the Assessment Book :**
**Try to answer :**
Self-Assessment (10)

# Exercises on Lesson 1

● Understand ○ Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. The Sun provides the Earth with ..........
   a. light only. b. warm only. c. light and warm. d. light and sound.
2. On extreme hot climate, the water of a lake .......... *(Assiut 2023)*
   a. increases due to evaporation. b. decreases due to evaporation.
   c. changes into ice. d. has a lower temperature.
3. All the following factors pollute the water, except .......... *(Assiut 2023)*
   a. sunlight. b. animals wastes.
   c. human wastes. d. plastic garbage.
4. If the amount of grasses increases in an ecosystem, this directly increases the number of .......... *(Cairo 2023)*
   a. caracals. b. hawks. c. rabbits. d. lions.
5. When the number of .......... , the amount of grasses in an ecosystem increases.
   a. producers decreases b. decomposers decreases
   c. primary consumers increases d. secondary consumers increases
6. Overfishing and throwing plastic garbage in the sea affect the survival of .......... directly.
   a. desert organisms b. marine organisms
   c. rainforest organisms d. rodents
7. All the following are human activities that affect a marine ecosystem, except ..........
   a. flooding. b. throwing human wastes.
   c. overfishing. d. throwing plastic garbage.
8. When there is a gentle rain in a desert ecosystem, this ecosystem may be ..........
   a. harmed. b. improved. c. destroyed. d. not changed. *(Cairo 2023)*
9. All the following are top predators, except ..........
   a. hawks. b. tigers. c. butterflyfish. d. lions.
10. The marine food web usually starts with .......... *(Menofia 2023)*
    a. clam. b. algae. c. zooplankton. d. parrotfish.
11. If clams are completely removed from a marine ecosystem, the survival of .......... may be affected.
    a. triggerfish b. sharks c. sea urchin d. sea stars

## 2 Put (✓) or (✗) :

1. If producers were removed from an ecosystem, the primary consumers will need to move away. ( )
2. Overfishing is one of the human activities that affects the marine ecosystem. *(Giza 2023)* ( )
3. What is happening on land doesn't affect what is happening in marine ecosystem. ( )
4. Food webs don't change if their surrounding environments get changed. ( )
5. If we introduce a new predator to an ecosystem, this ecosystem will be affected. ( )
6. If there is a heavy rain in a desert ecosystem, it will be harmed. ( )
7. Zooplankton can make their own food by photosynthesis process. ( )
8. In a marine food web, there are many top predators like sea star and sea urchin. ( )
9. Top predators are decomposers that present at the top of food chains. ( )

## 3 Write the scientific term of each of the following :

1. It is the harm that happens to the water due to human activity. (.....................)
2. A human activity that leads to decreasing the number of fish and affecting many marine food webs. (.....................)
3. They are consumers that exist at the top of food chains. (.....................)

## 4 Complete the following sentences :

1. Throwing plastic garbage and waste materials into a river causes water ................ *(Minia 2023)*
2. If producers increase in an ecosystem, the number of primary consumers will ..................
3. The human activity that doesn't pollute water but decreases the number of marine organisms is known as .................
4. Heavy rain causes ................. which destroys desert ecosystems.
5. The consumers that exist at the top of any food chain are called .................

## 5 Give reasons for :

1. When the number of one species of consumers in an ecosystem increases, they will die.

..........................................................................................................................................

..........................................................................................................................................

2. Death of algae may lead to moving sharks away to another places.

..........................................................................................................................................

..........................................................................................................................................

## 6 What happens if ... ?

1. Throwing big amounts of plastic garbage and waste materials in water.

   ..............................................................................................................................

   ..............................................................................................................................

2. A small lake is exposed to extreme hot climate for several months.

   ..............................................................................................................................

   ..............................................................................................................................

3. The number of secondary consumers in an ecosystem decreases.

   ..............................................................................................................................

## 7 Study the following food chain in an ecosystem, then complete the table below :

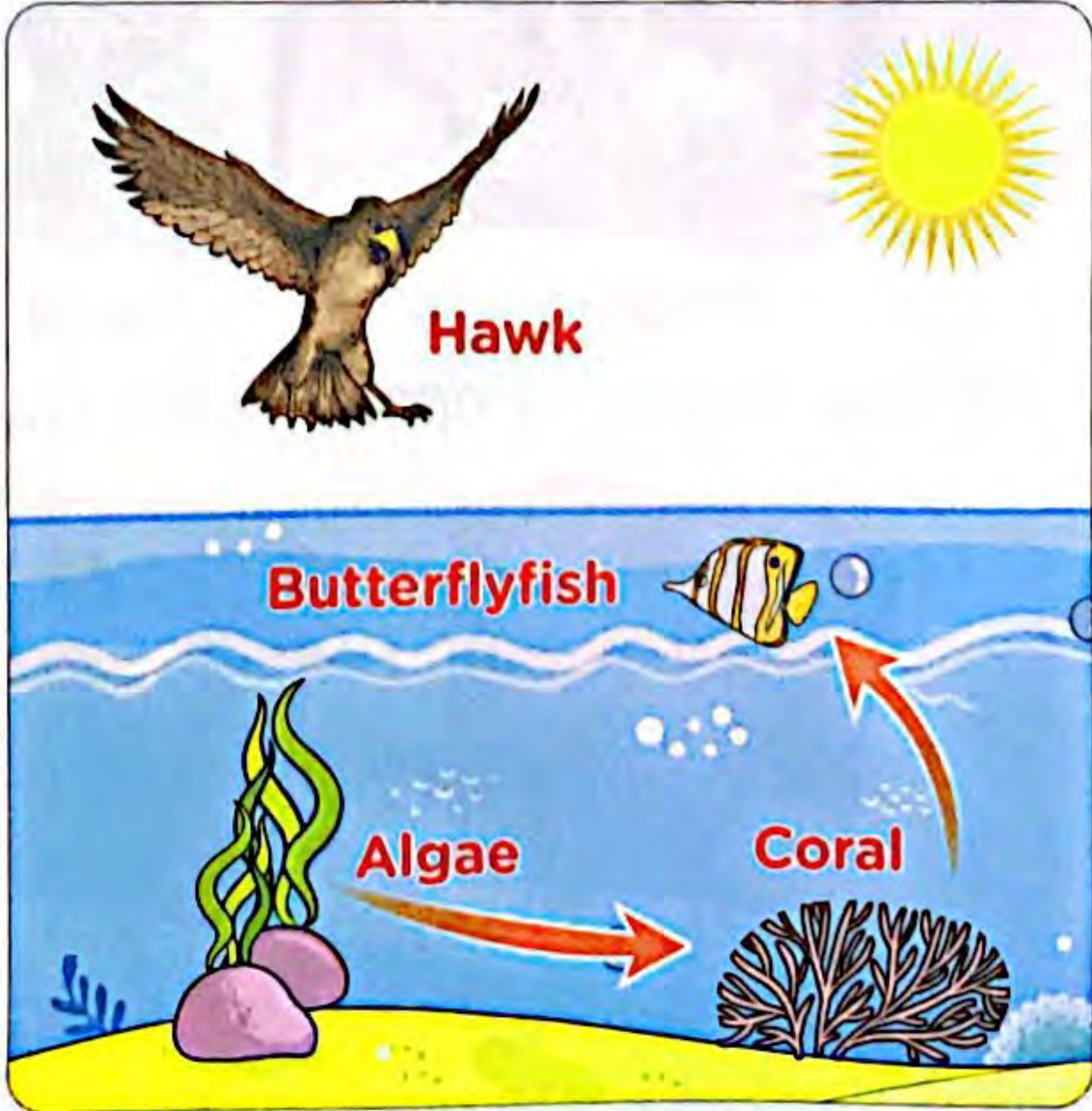

Grasses


Rabbit


Fox

| Situations | Results |
|---|---|
| 1. The number of rabbits increases. | The amount of ................ decreases, while the number of ................ increases. |
| 2. The amount of grasses decreases. | The number of rabbits ................ |
| 3. All ................ disappear or their role change in this food chain. | All foxes will move away to another ecosystem to search for food. |
| 4. The ecosystem of this food chain is affected by severe drought conditions. | All ................ die, because there is no water to make their own food. |

## 8 "What is happening on land affects what is happening in the marine environment". According to the previous fact, study the following figure then complete the sentences below :




1. The living organism that can make photosynthesis process is ..........
2. Energy can flow from marine environment to land, when the hawk eats ..........
3. If many sharks are present in this ecosystem, .......... will move to another ecosystem to search for food.

# LESSON TWO

## Activity 4 Energy Flow Body Model

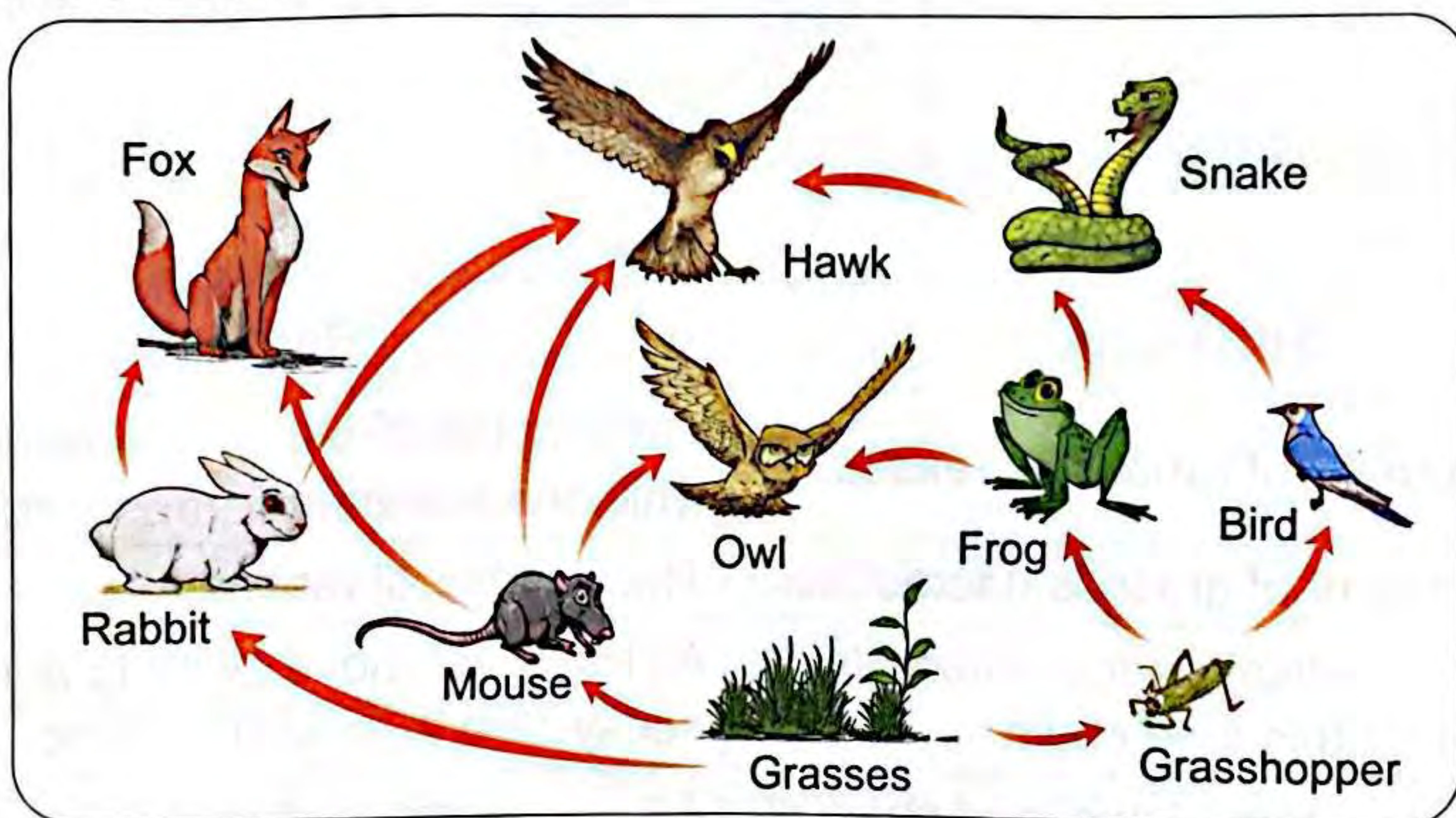
▶ Put (✓) or (✗) :

1. In an ecosystem, the plants are the producers. ( )
2. Lion and tiger are considered the top predators in an ecosystem. ( )

• **Now,** we are going to do an activity to make a model that shows the flow of energy through a food web.

### ▶ Tools

• A picture of a food web.




• Cards labeled with organisms.



Rabbit



Snake



Hawk



Grasses

• Paper squares (represent the flow of energy in an ecosystem).






## Steps

1. Choose some of your friends to play with them a game of predator-prey tag.
2. Observe the picture of the food web carefully with your friends.
3. Give each one of your friends a card labeled with an organism from the above food web and a paper square.
4. Start the game with your friends. If one of your friends becomes a prey to another friend which is a predator, so the prey gives his paper square to the predator.



## Observation

When a predator feeds on a prey, it gains energy, so the energy transfers from the prey to the predator.

## Conclusions

- The energy in an ecosystem remains the same.
- Although energy is transferred between living organisms, most of the energy is recycled by decomposers back into the ecosystem.



## Check your understanding

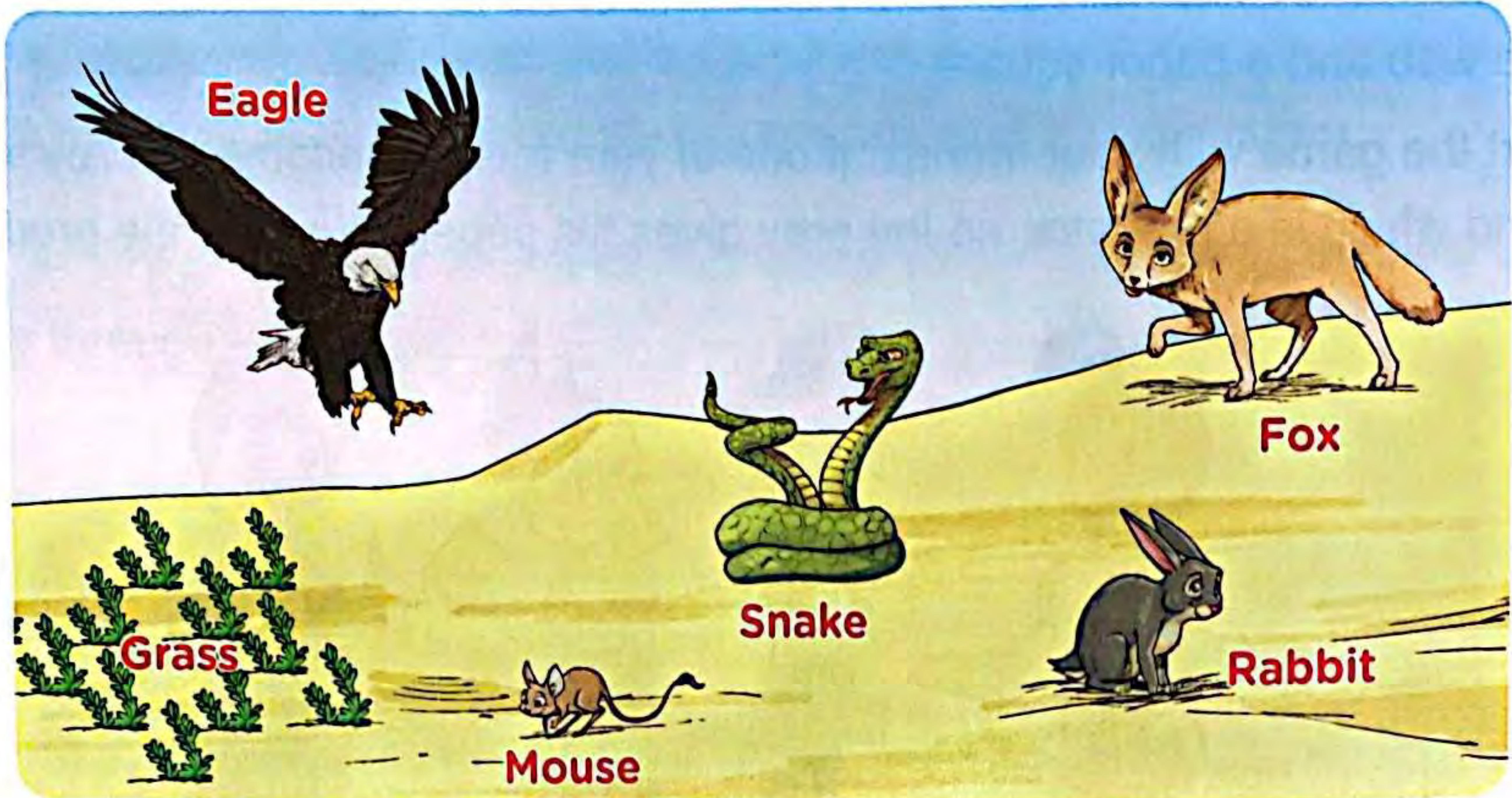
**Put (✓) or (✗) :**

1. In a food web, the energy transfers when a prey gains energy from the predator. ( )
2. Most of the energy in a food web transfers between living organisms when an organism feeds on the other. ( )

| | | |
|---|---|---|
| gain يكتسب | carefully بحرص | remain تبقى |

## Activity 5 Desert Food Web

▶ **Look at this desert food web, then use the table below to draw the arrows that show the flow of energy through this food web :**




| Number of arrows | Direction of arrows |
|---|---|
| ↑↑ (2 blue arrows) | Comes out of grass |
| ↑ (1 green arrow) | Goes to the snake |
| ↑↑↑ (3 red arrows) | Goes to the fox |
| ↑↑↑ (3 black arrows) | Goes to the eagle |

### ? What would happen to ...?

1. **The rabbits (hares) if all the grass were removed from the previous food web.**
   Rabbits would not find any food, so they would die.
2. **The eagles if all the grass were removed from the previous food web.**
   At first, the eagles would not be affected but when the rabbits die, the eagles would have less food.



### Check your understanding

▶ **According to the previous food web, complete this sentence using these words : (energy – rabbits – grass – eagles )**

Rabbits feed on (consume) the ......................, so the energy travels to the ......................, then the eagles feed on the rabbits and the ...................... travels to the ......................

| | | | | | |
|---|---|---|---|---|---|
| desert food web | شبكة غذائية صحراوية | eagle | نسر | hare | أرنبة |
| arrows | أسهم | direction | اتجاه | | |

# Activity 6 Population Changes

**Population :**

It is the number of organisms of one type of species living in an area.

- Any increase or decrease in the number of these organisms is known as " population change".

▶ **Change in the population of one species affects the population of other species, where :**

In an ecosystem, all species depend on other species for survival, so an increase or decrease in one species affects the population of other species.

Example :

**Microorganisms**

- They are tiny organisms that cannot be seen with our eyes.
- They can make their own food, so they are the producers in the marine food web.
- They are found in cold water habitats, because they need cold water to survive.
- The small fish feed on microorganisms that float on the surface of the sea.


Microorganisms

**Seabirds**

- They build their nests on the top of mountain cliffs.
- They dive deep down into the sea to feed on small fish which are the main source of food for many seabirds.


Seabird

| | | | | | |
|---|---|---|---|---|---|
| population | مجموعات الكائنات الحية | species | نوع | nests | أعشاش |
| seabirds | الطيور البحرية | mountain cliffs | المنحدرات الجبلية | microorganisms | الكائنات الدقيقة |
| main source | مصدر رئيسى | | | | |

**What will happen to microorganisms if the climate changes and the water becomes warm ?**

Microorganisms will move toward an area where the water is cooler



Then, the small fish that feed on these microorganisms will also move to a new habitat



Therefore, when seabirds do not have a food source, some of them will move to a new habitat, while others will die.

**From the previous example, we can conclude that :**

The climate change affects the population of a species, where :

- When the climate change is suitable, the population of a species increases.
- When the climate change is unsuitable, the population of a species decreases because the organisms would either die or move to another place.



## Check your understanding

**Complete the following sentences using these words :**

**(microorganisms – population – cold – seabirds)**

1. The ........................ feed on the small fish which feed on ........................ that float on the surface of the sea.
2. The number of organisms of one type of species living in an area is known as ........................
3. Microorganisms are found in ........................ water habitats.

In the Assessment Book :
Try to answer :
Self-Assessment (11)



| | | | |
|---|---|---|---|
| warm | دافئ | new habitat | موطن جديد |

# Exercises on Lesson 2

● Understand ● Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. If there is a tertiary consumer in a food chain, this means that there is/are ...........
   a. a primary consumer only.
   b. a secondary consumer only.
   c. a primary and a secondary consumers.
   d. neither primary nor secondary consumers.

2. The secondary consumer is considered as ...........
   a. a prey for primary and tertiary consumers.
   b. a predator for primary and tertiary consumers.
   c. a prey for primary consumer.
   d. a prey for tertiary consumer.

3. In a food chain, the energy transfers ........... *(Dakahlia 2023)*
   a. from a predator to a prey.
   b. from a prey to a predator.
   c. from a predator to a producer.
   d. from a consumer to a producer.

4. If all grasses were removed completely from an ecosystem, rabbits in this ecosystem will ...........
   a. increase.
   b. decrease.
   c. die.
   d. not be affected.

5. It is better for a predator in a food web to have ...........
   a. only one type of decomposers.
   b. more than one type of decomposers.
   c. only one type of prey.
   d. more than one type of prey.

6. Any increase or decrease in the number of organisms of one type of species is known as ...........
   a. an ecosystem.
   b. adaptation.
   c. a climate change.
   d. a population change.

7. If the climate change is suitable, the population of a species ...........
   a. will die.
   b. will not be affected.
   c. will increase.
   d. will decrease. *(Beni Suef 2023)*

8. Seabirds build their nests ...........
   a. on the water surface.
   b. on the top of mountain cliffs.
   c. deep down into the sea.
   d. deep down into the river.

9. All the following statements are correct, except ..........
   a. small fish can eat seabirds.
   b. sharks can eat small fish.
   c. small fish cannot eat seabirds.
   d. seabirds cannot eat sharks.

10. The suitable habitat for microorganisms to survive is .......... *(Alex. 2023)*
   a. hot water.
   b. warm water.
   c. cold water.
   d. boiled water.

## 2 Put (✓) or (✗) :

1. Most of living organisms are preys for some animals and also predators for others at the same time. ( )
2. The Sun produces energy that decomposers use to make their food. ( )
3. Any food chain can be formed of producers only. ( )
4. Energy transfers when a prey loses energy to the predator which feeds on it. ( )
5. A desert food chain doesn't contain any type of fish or sharks. *(Giza 2023)* ( )
6. If the climate change is unsuitable, the population of a species will decrease. ( )
7. In an ecosystem, all species depend on other species for survival. ( )
8. Seabirds eat small fish that swim near the water surface. ( )
9. Microorganisms are producers that small fish feed on to get energy. ( ) *(Alex. 2023)*

## 3 Write the scientific term of each of the following :

1. They are consumers which feed on secondary consumers. (....................)
2. They are living organisms that include bacteria and fungi, which return energy back to the soil. (....................)
3. It transfers between animals in a food web to help them do their activities and survive. (....................)
4. It is the number of organisms of one type of species live in an area. (....................) *(Cairo 2023)*
5. Any increase or decrease in the number of organisms. (....................)
6. Flying living organisms that build their nests on the top of mountain cliffs and dive deeply into the sea to eat. (....................)
7. They are organisms that are too small for people to see with only their eyes. (....................)

## 4 Complete the following sentences :

1. Predators of living organisms may be .................. for other living organisms.
2. Secondary consumers feed on .................. consumers.
3. All energy in all living organisms return back to the environment by the help of .................. organisms.
4. A predator gets .................. from the prey which feeds on.
5. If the climate change is suitable, the population of a species will .................. *(Giza 2023)*
6. Small fish feed on .................. that float on the surface of the sea.

## 5 Give reasons for :

Change in the population of one species affects the population of other species.

..................................................................................................................................

## 6 What happens if ... ?

1. The climate change is unsuitable for a population of one type of species.

..................................................................................................................................

2. The seawater becomes warm. *(Cairo 2023)*

..................................................................................................................................

## 7 Study the following figures, then put (✓) or (✗) :


Figure (A)


Figure (B)


Figure (C)

1. All living organisms in figures (A) and (B) can make their own food by photosynthesis process. ( )
2. Some marine organisms are present in figure (B). ( )
3. Top predators are found only in figure (A). ( )
4. All animals in figure (A) can find a prey in figure (B), except the shark. ( )
5. To form a food chain, you have to rearrange the previous figures as follows : Figure (C) $\xrightarrow{\text{then}}$ Figure (B) $\xrightarrow{\text{then}}$ Figure (A). ( )

**8 Study the following two diagrams, then put (✓) or (✗) :**

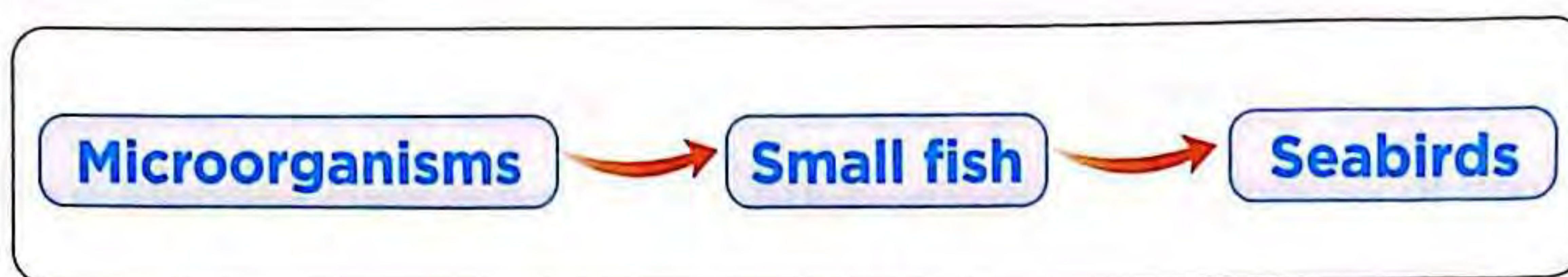



Diagram (A)

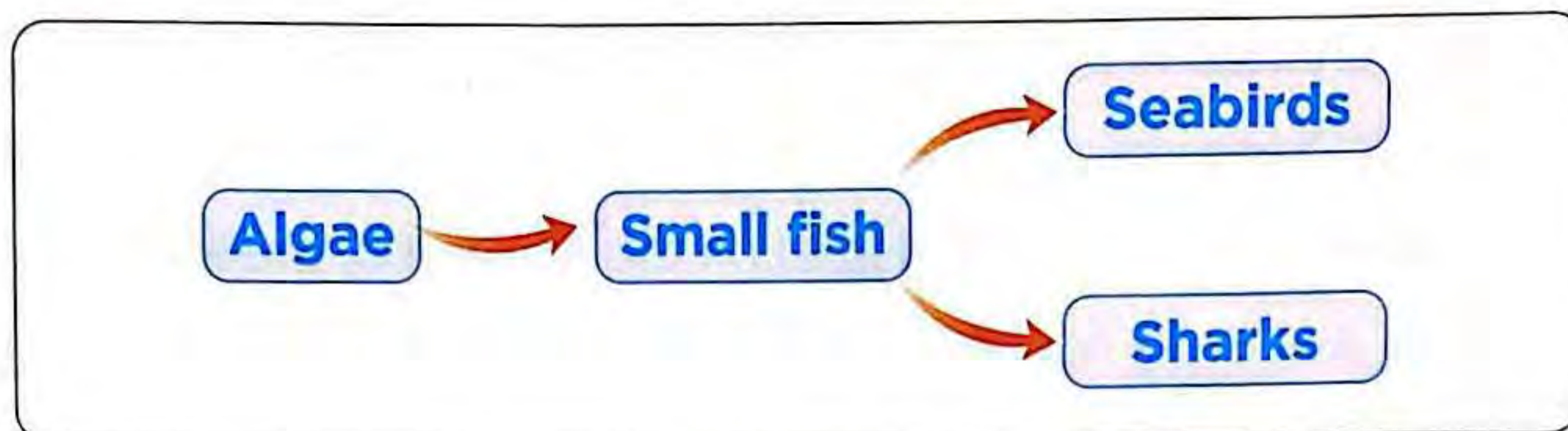



Diagram (B)

1. Both diagrams (A) and (B) show two food webs. ( )
2. In diagram (B), both of seabirds and sharks are secondary consumers. ( )
3. In diagram (A), if small fish are removed, the seabirds are negatively affected. ( )
4. There is a food relationship between seabirds and sharks, where each of them can eat the other. ( )
5. In diagram (B) if sharks are removed, the seabirds population may be decreased. ( )

# LESSON THREE

## Activity 7 Habitat Loss

▶ **Put (✓) or (✗) :**

1. A healthy habitat should provide living organisms with air, food, water and shelter to survive. ( )
2. Living organisms are not affected if their habitat get destroyed. ( )

### Habitat loss

- Habitats provide organisms with all the things they need to survive.
- Some human activities can change the habitats in an ecosystem such as :
  - Building up more buildings and roads.
  - Throwing waste materials in water.
  - Overfishing in seas and oceans.
- Human activities can also impact the weather and nonliving factors in an ecosystem, such as the temperature of ocean water.
- All of these changes can cause habitat loss which is one of the main causes of extinction.

▶ **Why are healthy habitats important to all organisms in a food web ?**

- Because they provide organisms with resources that they need to survive as air, food, water and shelter, so if each species gets its needs to survive, there will always be enough food for each organism in the food web.
- When these habitats are destroyed, different organisms may not be able to survive and this will negatively affect the flow of energy in the food web.

▶ **Now,** we will study an example of habitat loss in a coral reef system.

### Coral reefs

- Coral reefs are some of the most diverse and valuable ecosystems on Earth.
- Coral reefs are important habitats for living organisms as coral reefs provide food and shelter for large numbers of fish and other marine organisms.



- They are important for tourism, where people travel to coral reefs for fishing or diving. This help increase the visitors and income of local hotels, restaurants and other businesses.



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| healthy habitats | المواطن الصحية | provide | توفر / تزود | enough | كافي | local hotels | الفنادق المحلية |
| impact | تؤثر | extinction | إنقراض | valuable | ذو قيمة | tourism | السياحة |
| diverse | تنوع | income | دخل / إيراد | visitors | الزائرين | business | شركات |


**Note**

Corals are small marine animals that live in coral reefs ecosystems.


Corals

## Coral bleaching

**Coral reefs bleaching happens when the water temperature rises, where :**

When the water is very warm, coral reefs will get rid of the algae living in their tissues.



This causes the coral reefs turn completely into white.



As a result of coral reefs bleaching, corals often do not survive.


Coral bleaching

▶ **How might the loss of coral reefs change the ocean food webs ?**

Destroying of coral reefs causes :

- Fish and other marine organisms that depend on coral reefs for food and shelter may die or move to another habitat.
- People that depend on coral reefs and fish for food will be negatively affected.



## Check your understanding

▶ **Put (✓) or (✗) :**

1. Coral bleaching happens when the temperature of seawater decreases. (   )
2. Habitat loss is not considered from causes of extinction. (   )
3. From human activities that change the habitats in an ecosystem is overfishing in seas. (   )

| | | | |
|---|---|---|---|
| coral | حيوان المرجان | get rid of | يتخلص من |
| coral reefs bleaching | ابيضاض الشعاب المرجانية | tissues | أنسجة |

# Activity 8 Plastic Pollution

You have learned from the previous lessons that human activities may negatively affect the environment as the impact of throwing plastics in the marine environments.

## The effect of plastic products on marine life

Plastics in the sea affect marine life, where whales, sea turtles, seabirds and fish cannot often differentiate between real food and plastic.

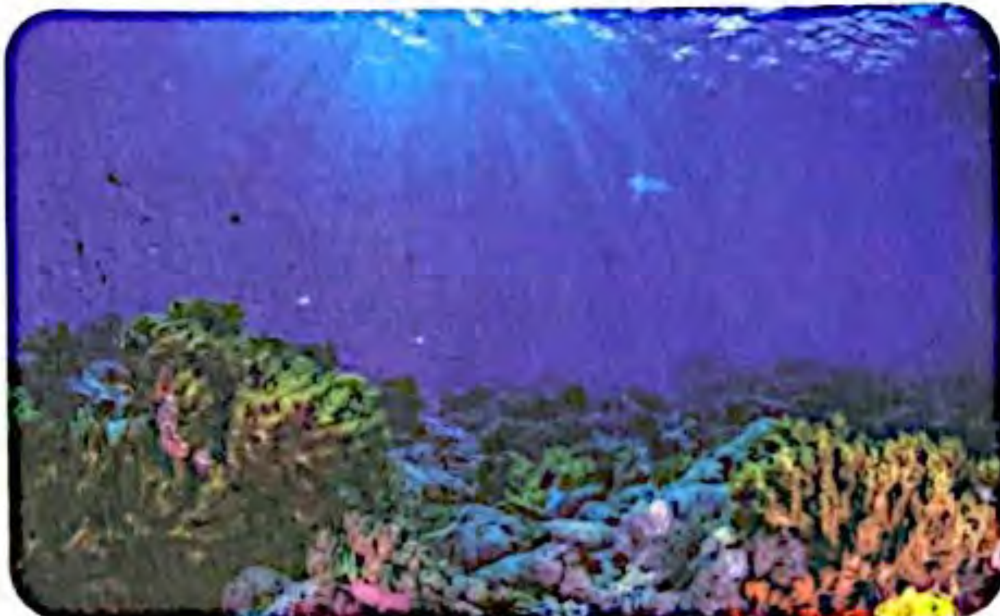
Examples :

### 1 How do sea turtles get harmed by feeding on plastic ?



- Sea turtles cannot differentiate between a jellyfish and a piece of plastic in the water.
- Therefore, sea turtles eat a lot of plastic thinking that it is jellyfish, so sea turtles get harmed.

### 2 How do corals get harmed by feeding on plastic ?



- Plastic products get broken down into smaller pieces called **microplastics** (smaller than a grain of rice).
- When corals filter the seawater to get their food, they ingest these microplastics that are as small as the pieces of food that corals get from the water, so corals get harmed.

**Notes**

1. A large quantities of plastic are thrown into the marine environment every year, most of them come from land.
2. Plastics are very harmful to marine organisms because they are toxic and sharp.
3. If the amount of plastic in the sea or ocean increases, plastics will harm marine habitats and affect the organisms that live in the sea or ocean.
4. People can decrease their use of plastic products or recycle them instead of throwing them in the sea.



## Check your understanding

In the Assessment Book :
Try to answer :
Self-Assessment (12)

▶ **Put (✓) or (✗) :**

1. When the amount of plastic increases in the sea, the number of marine organisms increases. (   )
2. Plastics are very harmful to marine organisms as they are toxic and sharp. (   )

| | | | |
|---|---|---|---|
| plastic products المنتجات البلاستيكية | differentiate يفرق | piece قطعة | grain of rice حبة الأرز |
| ingest يبتلع | microplastics الجسيمات البلاستيكية | filter يُصفي / يُرشح | recycle إعادة تدوير |
| toxic سام | sharp حاد | instead of بدلاً من | harmful ضار |

# Exercises on Lesson 3

● Understand ● Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. Healthy marine environment is important for survival of ...........
   a. humans. b. lions. c. fish. d. deers.
2. All the following are healthy resources for marine food webs, except ...........
   a. clean water and food. b. clean food and shelter.
   c. clean shelter and water. d. polluted water, food and shelter.
3. When the marine habitats are destroyed, the number of living organisms in their food webs is ...........
   a. increased. b. decreased. c. not changed. d. doubled.
4. All the following may occur due to habitat loss, except ...........
   a. increasing of population. b. decreasing of population.
   c. extinction of some organisms. d. decreasing of resources.
5. Coral reefs are considered as ...........
   a. insects. b. bacteria. c. ecosystems. d. fungi.
6. When water temperature increases, algae leave tissues of ..........., so they become bleached.
   a. seabirds b. coral reefs c. clam d. sharks
7. As a result of coral reefs bleaching, corals will ...........
   a. increase. b. enlarge. c. survive. d. die.
8. Plastic waste materials cause all the following to the marine environment, except ...........
   a. break down in food webs. b. pollution of water.
   c. increasing of population. d. decreasing of population.
9. Both of sea turtles and ........... are present in the same marine food chain.
   a. deers b. jellyfish c. eagles d. tigers *(Cairo 2023)*
10. When corals ........... the seawater, they may ingest microplastics. *(Minia 2023)*
    a. evaporate b. filter c. cool d. warm
11. Corals are negatively affected by ...........
    a. rising water temperature only.
    b. ingesting microplastics only.
    c. Both of rising temperature and ingesting microplastics.
    d. neither rising of temperature nor ingesting microplastics.

## 2 Put (✓) or (X) :

1. Healthy habitats provide living organisms with clean air, healthy food and water. *(Beni Suef 2023)* (   )
2. The flow of energy in food webs is not affected when the natural habitats are destroyed. (   )
3. Human activities impact the nonliving factors in an ecosystem. (   )
4. Healthy coral reefs have no benefit to fish but they are important for tourism. (   )
5. When the temperature of seawater decreases, coral reefs receive more algae. *(Alex. 2023)* (   )
6. Coral bleaching occurs as a result of throwing plastic in seawater. (   ) *(Cairo 2023)*
7. Living organisms in seas and oceans cannot differentiate between real food and plastic waste materials. (   )
8. Jellyfish can get its energy by eating the sea turtle. (   )
9. Corals filter the seawater to get their needed food. (   )

## 3 Write the scientific term of each of the following :

1. It is a condition in which coral reefs turn completely into white. (....................)
2. Small pieces of plastics in the size of rice grains and they cause harms to marine organisms. (....................)
3. Marine ecosystems that provide food and shelter for corals, fish and other marine organisms. (....................)

## 4 Complete the following sentences using these words :

**(extinction – overfishing – shelter – toxic – predator)**

1. Healthy natural resources include clean air, healthy food, water and suitable .................. *(Giza 2023)*
2. The human activity that directly decreases the marine population is .................. *(Giza 2023)*
3. Habitat loss is not only decreasing marine population but also it is one of the main causes of ..................
4. When a sea turtle eats a jellyfish, this means that the sea turtle is a .................. living organism.
5. Plastic waste materials are very harmful to marine organisms, because they are .................. and sharp. *(Giza 2023)*

## 5 Give reasons for :

*(Gharbia 2023)*

1. Coral bleaching happens when the water temperature rises.

...........................................................................................................

...........................................................................................................

2. Plastics are very harmful to marine organisms.

...........................................................................................................

...........................................................................................................

## 6 Study the following figures, then put (✓) or (✗) :



Plastic products in water



Sea turtle



Jellyfish

1. We can draw arrows between plastic products, jellyfish and sea turtle to design a food chain. (   )
2. The sea turtle can differentiate between plastic and jellyfish. (   )
3. Both of jellyfish and sea turtle are consumers. (   )

# LESSON FOUR

## Activity 9 Record Evidence Like A Scientist

- In this concept, you have learned about changes in food webs.
- **Now,** try to think like a scientist by writing your claim, your evidence and your scientific explanation about one of the main points of this concept through the four steps you have learned in concept one.

**Step 1 The Question**

What might happen to a food web when an organism or the environment changes within an ecosystem ?

**Step 2 My Claim**

.....................................................................................................

.....................................................................................................

.....................................................................................................

**Step 3 My Evidence**

.....................................................................................................

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.....................................................................................................

.....................................................................................................

**Step 4 My Scientific Explanation**

.....................................................................................................

.....................................................................................................

.....................................................................................................

.....................................................................................................

.....................................................................................................

claim فرضية | evidence دليل | scientific explanation تفسير علمى

## Activity 10 Habitat Restoration

- You have known that environmental changes and human activities may negatively impact ecosystems.
- But, there are ways through which we can restore the habitat leading to a healthy and balanced ecosystem.
- Restoration projects allow scientists to find out better solutions for reducing the negative impacts of human activities.
- Human activities can cause big changes to the environment such as :

**When many plants are removed, riverbanks erode, so floods may reach farther areas when wetlands are drained.**



- Once harm occurs to the environment, scientists, engineers and citizens work on "Habitat restoration".

### Habitat restoration :

It is the process of returning a habitat back to its natural state before harm was done.

### The importance of habitat restoration projects

Habitat restoration projects try to repair all parts of the habitat, where they help prevent species from extinction by restoring the habitat (including the resources of food, water and shelter) to the way it was before its damage.

### Rebuilding coral reefs

One example of restoring a habitat is "a coral reef rehabilitation project" that happens in the Arabian Gulf, where :

- Scientists collect small parts of different coral species and then move them to a "nursery".



Coral reefs

| | | | | | |
|---|---|---|---|---|---|
| environmental changes | التغيرات البيئية | projects | مشاريع | riverbanks | ضفاف النهر |
| erode | تآكل | wetlands | الأراضي الرطبة | citizens | المواطنين |
| repair | إصلاح | prevent | يمنع | rebuilding | إصلاح / إعادة بناء |
| rehabilitation project | مشروع إعادة تأهيل | Arabian Gulf | الخليج العربي | nursery | المشتل |

- Nursery is an area in the sea or ocean, where scientists take care of small pieces of coral until they grow up and can be moved back to the reefs where they were dying.
- The healthy coral can continue growing and reproducing to make a new coral reef again.

## Protecting coral reefs from plastic pollution

In Egypt, coastal communities near the coral reefs use a new way of life known as "zero plastics", where people in these communities decrease using of one-use plastic products.



Coral reefs

### What happens if ...?

**A habitat is not restored.**

Many species in this habitat may be lost, because they cannot get their needs to survive.



## Check your understanding

▸ Put (✓) or (×) :

1. Human activities can't cause changes in the environment. (   )
2. Habitat restoration means returning a habitat back to its natural state before harm was done. (   )
3. People should not throw plastic waste into the sea. (   )

**Review on Concept [ 1 - 3 ]**

To review this concept look at the **Assessment Book "Part 2 : Final Revision".**

**In the Assessment Book :**

**Try to answer :**
- Self-Assessment (13)
- Model Exam on Theme (1)

# Exercises on Lesson 4

Understand    Apply    Higher Thinking Skills

## 1 Choose the correct answer :

1. Which of the following human activities doesn't harm a marine ecosystem ? ..........
   a. Throwing plastic products in water.
   b. Leakage of oil into water.
   c. Overfishing and damaging of coral reefs.
   d. Recycling of plastic products.

2. Habitat restoration projects allow scientists to .......... that occur to an ecosystem.
   a. increase harms    b. decrease harms
   c. keep harms    d. increase damages

3. Removing plants in an ecosystem negatively impacts .......... *(Qalyoubia 2023)*
   a. water.    b. sunlight.
   c. primary consumers.    d. nonliving things.

4. The place in which we can take care of small pieces of coral until they grow up is located in ..........
   a. seas.    b. air.    c. deserts.    d. forests.

5. The area in which the scientists take care of small pieces of coral until they grow up is known as .......... *(Cairo 2023)*
   a. food chain.    b. food web.    c. grassland.    d. nursery.

6. All the following processes show coral reefs in healthy conditions, except .......... process.
   a. growing    b. bleaching    c. reproducing    d. filtration

7. "Zero plastics" project that is applied in Egyptian coastal communities, means that the using of plastic products decreases by ..........
   a. 0%    b. 10%    c. 90%    d. 100%

---

## 2 Put (✓) or (X) :

1. Removing plants negatively affects consumers in an ecosystem. *(Alex. 2023)* (   )
2. Restoration projects are used to find out solutions for increasing pollution. (   )
3. It is better to keep natural resources healthy instead of applying restoration projects on them. (   )
4. Citizens must share in returning a habitat back to its healthy condition before harm was done. (   )
5. Nursery is the natural habitat in the sea, in which scientists take care of corals until they grow up. (   )

## 3 Write the scientific term of each of the following :

1. It is an area in the sea, where scientists take care of small pieces of coral until they grow up. *(Luxor 2023)* (....................)
2. A process of returning a habitat back to its natural state before harm was done. (....................)

## 4 Complete the following paragraph using these words :

**(dying – grow up – bleaching – nursery)**

We can protect coral reefs from ................. by transferring corals into ................. in the sea, where scientists take care of corals until they ................. and then moved back to the reefs to continue growing where they were .................

## 5 Give a reason for the following :

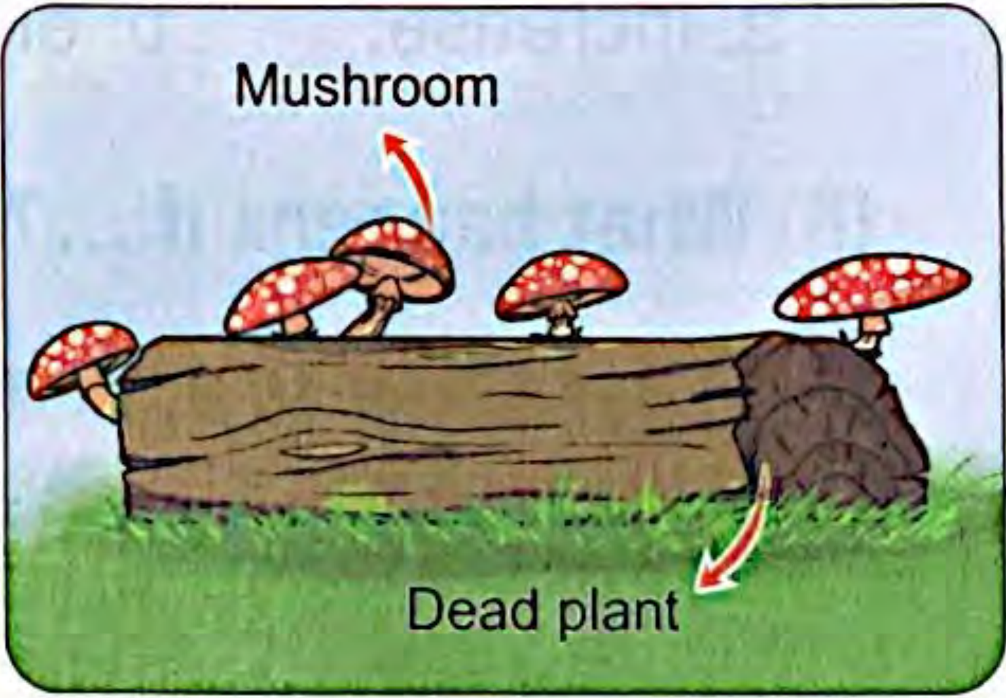
When we remove plants from riverbanks, the floods become more dangerous.

..........................................................................................................................................

## 6 Study the opposite figure, then choose the correct answer :

This figure shows .................

a. energy transfers from mushrooms to dead plant.
b. energy transfers from dead plant to mushrooms.
c. oxygen gas transfers from air to dead plant for breathing process.
d. carbon dioxide gas transfers from air to dead plant for photosynthesis process.




## 7 Choose what happens if we cut down a large number of trees in a forest ?

| | Carbon dioxide gas in air | Riverbanks | Flooding |
|---|---|---|---|
| a. | decreases | erode | increases |
| b. | decreases | increase | decreases |
| c. | increases | erode | increases |
| d. | increases | increase | decreases |

# Model Exam 1
## on Concept (1.3)

Total mark
15

**1** **(A) Choose the correct answer :** *(5 marks)*

1. All the following factors pollute the water, except ..........
   a. plastic garbage. b. sunlight.
   c. animals wastes. d. humans wastes.
2. In a food chain, the energy transfers ..........
   a. from a consumer to a producer. b. from a predator to a producer.
   c. from a predator to a prey. d. from a prey to a predator.
3. Seabirds build their nests ..........
   a. on the water surface. b. deep down into the sea.
   c. on the top of mountain cliffs. d. deep down into the river.
4. As a result of coral reefs bleaching, corals will ..........
   a. increase. b. enlarge. c. survive. d. die.

**(B) What happens if ...?**

The number of secondary consumers in an ecosystem decreases.

..........

..........

**2** **(A) Put (✓) or (✗) :** *(5 marks)*

1. People can recycle plastic products instead of throwing them in the sea. ( )
2. Microorganisms that live in water increase when the water becomes warmer. ( )
3. Some marine organisms depend on coral reefs for food and shelter. ( )
4. Tigers are considered as top predators in marine food chains. ( )

**(B) Give a reason for the following :**

Coral bleaching happens when the water temperature rises.

..........

..........

**3 (A) Write the scientific term of each of the following :** *(5 marks)*

1. It is an area in the sea, where scientists take care of small pieces of coral until they grow up. (..................)
2. Small pieces of plastics in the size of rice grains and they cause harms to the coral reefs. (..................)
3. It is the number of organisms of one type of species living in an area. (..................)
4. It is harm that happens to the water due to human activity. (..................)

**(B) Correct the underlined words :**

1. Due to rising of water temperature, coral reefs turn completely into <u>green</u>. (..................)
2. If the number of <u>secondary</u> consumers increases, the amount of producers in this ecosystem will decrease. (..................)

# Model Exam 2 on Concept (1.3)

Total mark
15

## 1 (A) Put (✓) or (X) : *(5 marks)*

1. If the climate change is suitable, the population of a species will decrease. (   )
2. Corals can make their own food by photosynthesis process. (   )
3. Overfishing is a human activity that can change the habitat in a marine ecosystem. (   )
4. It is better to keep natural resources healthy instead of applying restoration projects on them. (   )

### (B) Give a reason for the following :

Change in the population of one species affects the population of other species.

..................................................................................................................................

..................................................................................................................................

## 2 (A) Choose the correct answer : *(5 marks)*

1. If clams are completely removed from a marine ecosystem, the survival of ........... may be affected.
   a. sharks    b. sea urchin
   c. tiggerfish    d. sea stars
2. Habitat restoration projects allow scientists to ........... that occur to an ecosystem.
   a. increase harms    b. decrease harms
   c. keep harms    d. increase damages
3. Any increase or decrease in the number of organisms of one type of species is known as ...........
   a. a climate change.    b. an ecosystem.
   c. a population change.    d. adaptation.
4. When there is a gentle rain in a desert ecosystem, this ecosystem may be ...........
   a. harmed.    b. improved.    c. destroyed.    d. not changed.

**(B) What happens to ...?**

The coral reefs when the seawater temperature rises.

..............................................................................................................................................

..............................................................................................................................................

**3 (A) Complete the following sentences using these words :** *(5 marks)*

**(microorganisms – small fish – preys – primary consumers)**

1. Producers in the marine food chains, are ...........
2. Small fish are considered as ........... , when they eat the producers.
3. Seabirds feed on ........... to get energy.
4. Predators of living organisms may be ........... for other living organisms.

**(B) Cross out the odd word :**

1. Tiger – Rabbit – Shark – Crocodile. (....................)
2. Insects – Trees – Algae – Grasses. (....................)

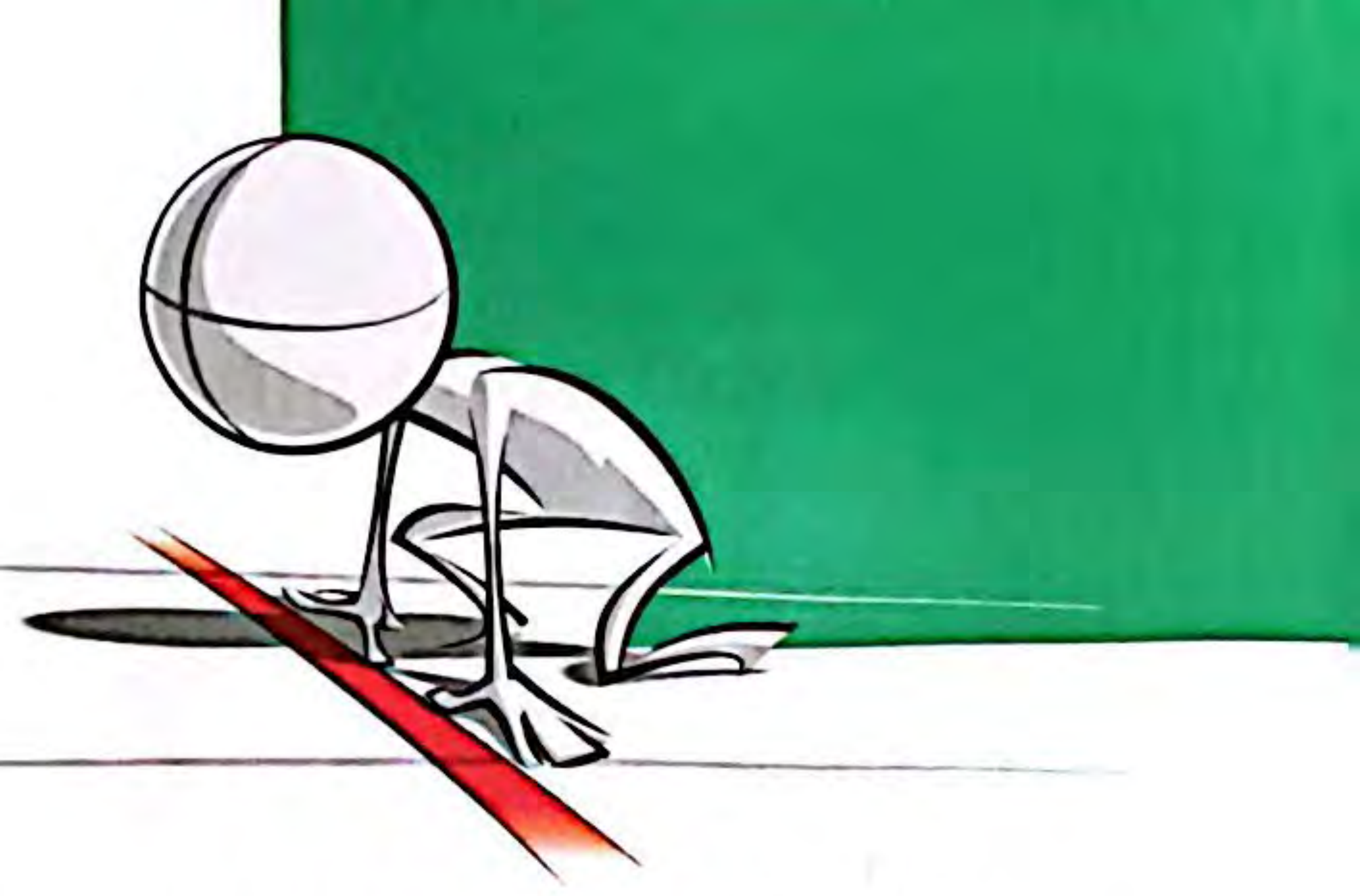
# THEME TWO : MATTER AND ENERGY

# 2 UNIT




# PARTICLES IN MOTION

# Get Started



## What I Already Know

- **In the previous years, you have learned that matter can be found in three states which are solids, liquids and gases.**



Picture (1)



Picture (2)



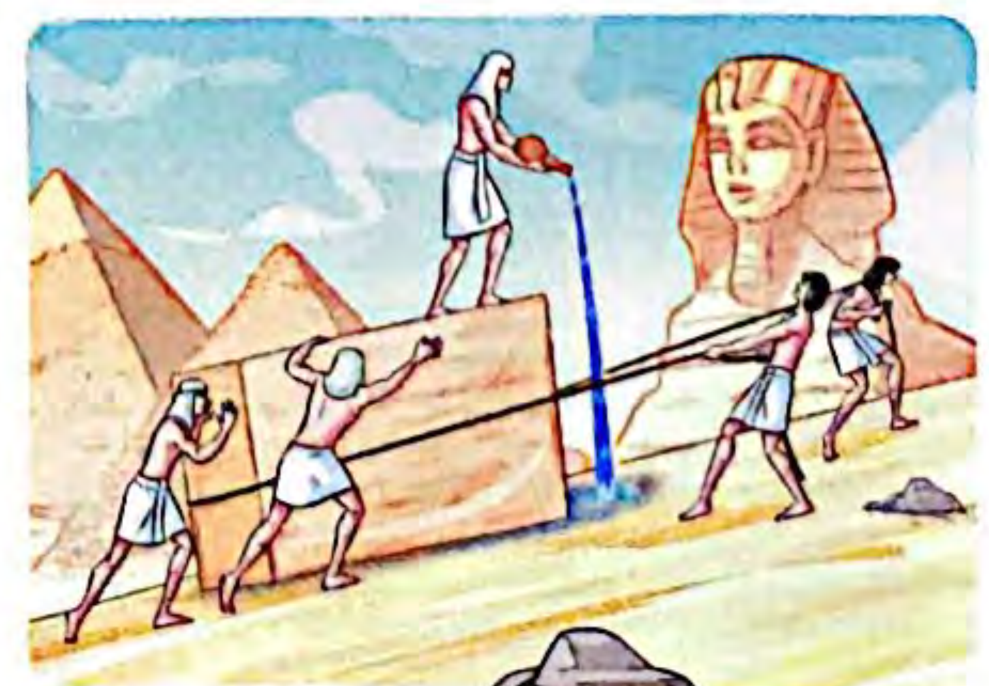
Picture (3)

- **When observing the pictures above that show different volcanoes, you can find the three states of matter, where :**
  - Picture (1) shows gases come out of a volcano.
  - Picture (2) shows lava which is a liquid state of matter that comes out during a volcanic eruption.
  - Picture (3) shows volcanic rocks which are solid state of matter. These rocks are formed when lava cools down.

- **In this unit, you are going to study :**
  - Matter is composed of very small particles.
  - The properties of particles of solids, liquids and gases.
  - How to identify, describe and measure matter.
  - Physical changes and chemical changes of matter.

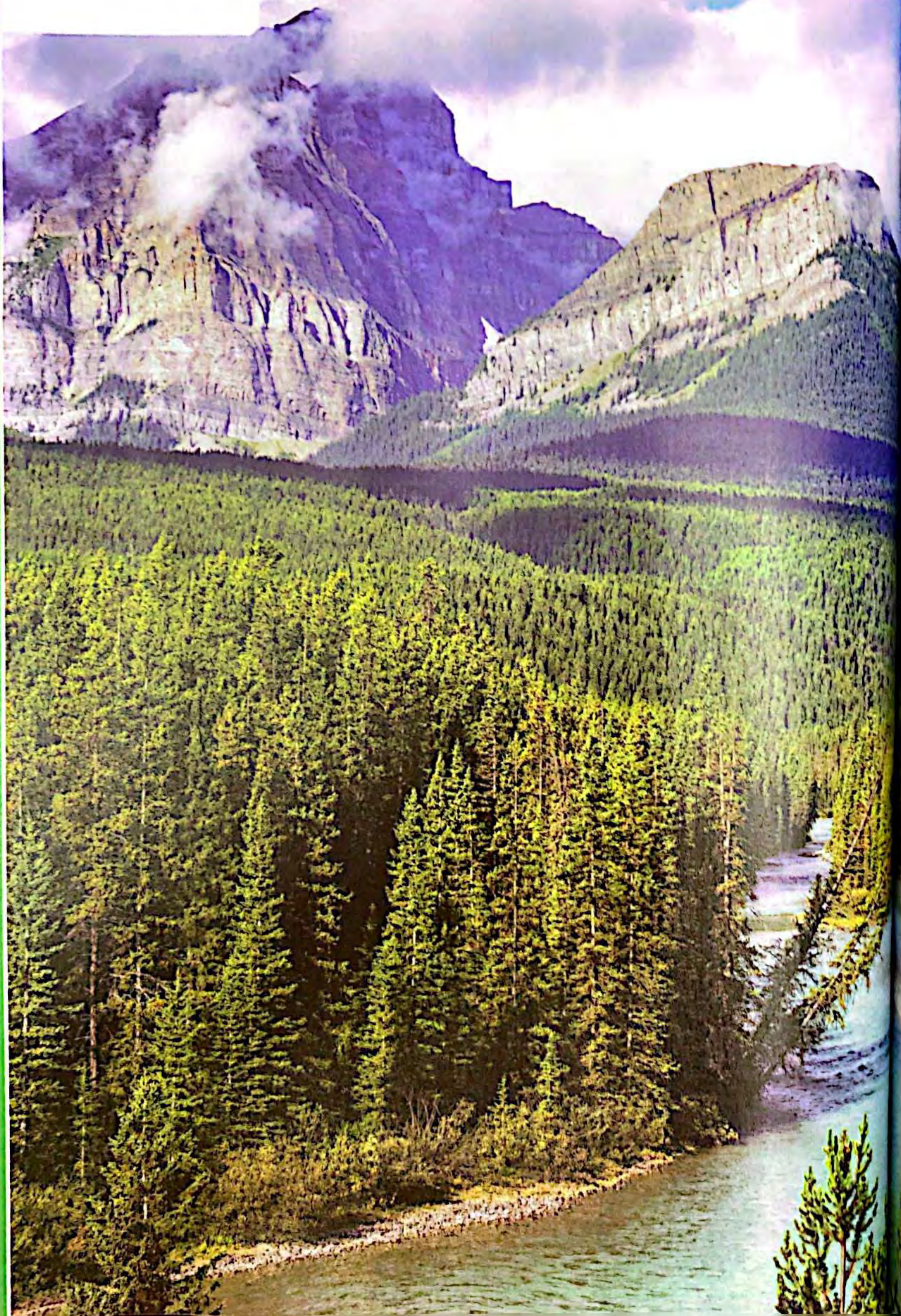
- **Unit Project : "Slippery Sand":**

At the end of this unit, you will make a research project about how the ancient Egyptians mixed sand with water to move the large heavy blocks of stones across the desert sand to build the pyramids.



Concept

# 2.1 Matter in the World Around Us





## Learning outcomes

**By the end of this concept, your child will be able to :**

- Communicate the defining characteristics of the three states of matter.
- Explain how changes in states of matter result in changes to the movement of the particles within matter.
- Develop models of particles of matter in different states.

## Key vocabulary

- Gas
- Liquid
- Mass
- Material
- Matter
- Model
- Particle
- Property
- Solid
- State of matter

# Notes For Parents On Concept [2.1]

| Lessons | Activities | What you should do with your child |
|---|---|---|
| 1 | Activity 1 | Discuss with your child the three states of matter on Earth. |
| | Activity 2 | Discuss with your child that the water found in three states solid, liquid and gas. |
| 2 | Activity 3 | Explain to your child how to describe the three states of matter. |
| | Activity 4 | Discuss with your child the differences between particles in each state of matter. |
| 3 | Activity 5 | Explain to your child that any matter is made up of very tiny particles. |
| | Activity 6 | Explain to your child how modeling the particles of matter. |
| | Activity 7 | Discuss with your child how particles of any matter are very tiny. |
| 4 | Activity 8 | Discuss with your child the importance of models. |
| | Activity 9 | Explain to your child the arrangement of particles in each state of matter. |
| 5 | Activity 10 | Help your child to think like a scientist by answering a question about one of the main points of this concept, then write his/her claim, evidence and the scientific explanation. |
| | Activity 11 | Discuss with your child how we use the three states of matter to prepare and cook food. |

# LESSON ONE

## Activity 1 Can You Explain ?





- **The pictures above show different matter such as waterfall, buildings and mountains.**
  - Everything around us is made of matter.

- **What are the different forms of matter can be found in the world around us ?**
  - Matter is found in three main forms (states), which are :
    - **Solid :** such as ice, wood, stone, iron, .......... etc.
    - **Liquid :** such as water, oil, milk, gasoline, .......... etc.
    - **Gas :** such as water vapor, oxygen, carbon dioxide, .......... etc.
  - To describe any matter, you should study its properties such as shape, volume (size), color, texture, hardness, temperature .......... etc.
  - Any matter is made up of tiny things that we cannot see with our eyes.
    - **Generally,** matter can be defined as follows :

**Matter :**

It is anything that has a mass and takes up space.

**Note**

Any matter takes up space means that this matter has volume.

- **In this concept, we will study :**
  - States of matter.
  - Particles of matter.
  - Modeling the particles of matter.
  - Tiny particles size.

| | | | | | |
|---|---|---|---|---|---|
| matter | مادة | states / forms | حالات | tiny | صغيرة |
| mass | كتلة | texture | ملمس | model | نموذج |
| volume | حجم | hardness | صلابة | shape | شكل |
| waterfall | شلال | properties | صفات / خصائص | vapor | بخار |

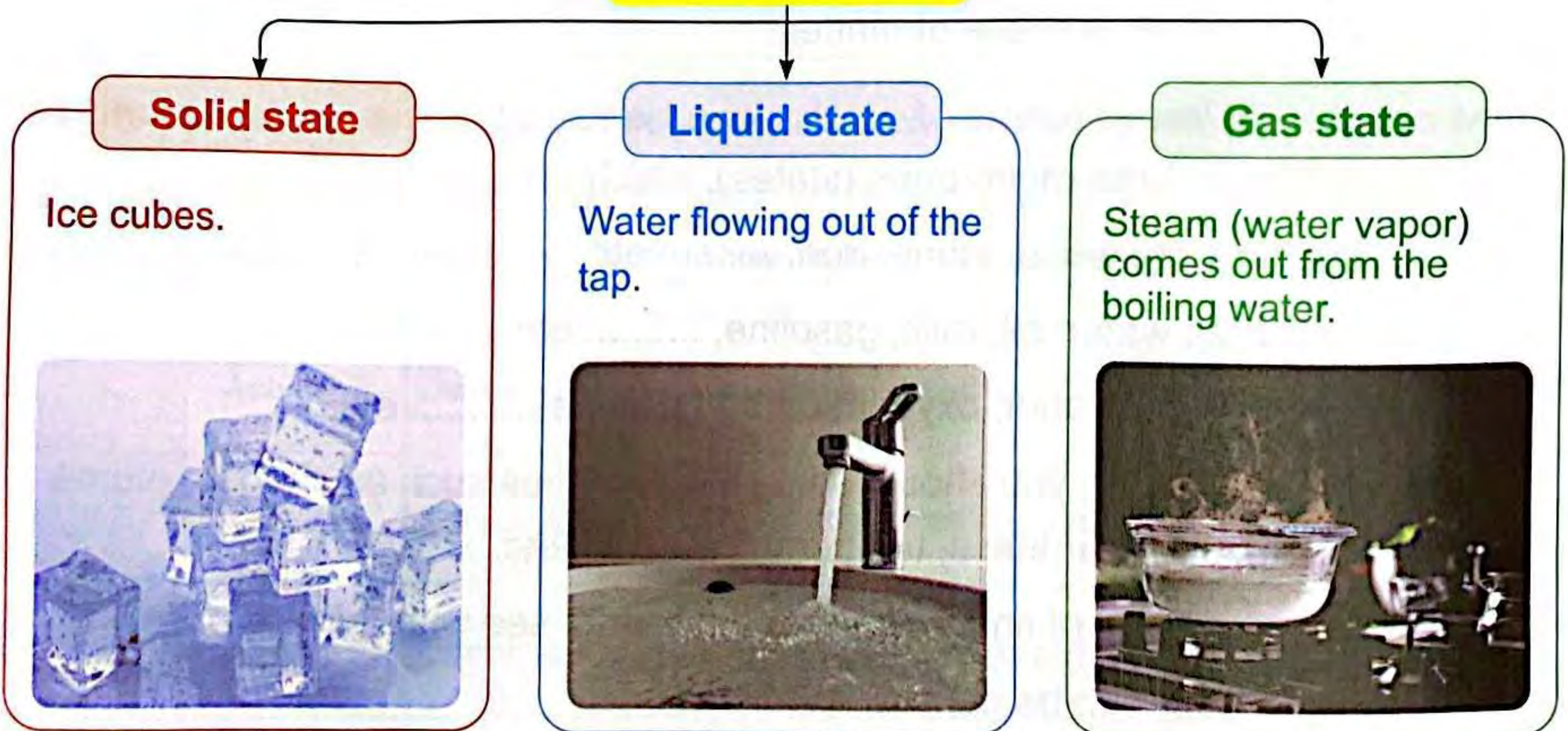
## Activity 2 States of Water

▶ **Look at the opposite picture, then put (✓) or (×) :**



1. Ice cubes are considered the liquid state of water. ( )
2. Water is found on Earth in the liquid state only. ( )

▶ **Now,** let's study the three states of water as an example that shows the three states of matter.




▶ **From the previous explanation, we can observe that :**

1. Water can be found in the three states of matter.
2. Water can be changed from one state into another.



## Check your understanding

▶ **Put (✓) or (×) :**

1. Steam that comes out of a hot cup of tea is considered the liquid state of water. ( )
2. Water is found in three states on Earth. ( )

**In the Assessment Book :**
Try to answer :
Self-Assessment (14)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ice cubes | مكعبات ثلج | flowing out | تدفق | tap | صنبور | steam | بخار |

# Exercises on Lesson 1

● Understand ○ Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. Matter can be found in .......... states.
   a. 2 b. 3 c. 6 d. 7
2. Water can be found in a solid state in the form of ..........
   a. ice. b. steam. c. sea water. d. boiling water.
3. An example of a gas is .......... *(Giza 2023)*
   a. chocolate. b. rock. c. pencil. d. oxygen.
4. The amount of space that a matter takes up is called ..........
   a. volume. b. mass. c. weight. d. area.
5. All of these substances are liquids, except .......... *(Cairo 2023)*
   a. oil. b. milk. c. stone. d. vinegar.
6. Both .......... and .......... have the same state of matter.
   a. wood – water b. plastic – oil c. wood – milk d. wood – plastic

## 2 Choose from column (B) what suits it in column (A) :

| (A) | (B) |
|---|---|
| 1. Carbon dioxide<br>2. Sand<br>3. Gasoline | a. is not a matter.<br>b. is a liquid matter.<br>c. is a gas matter.<br>d. is a solid matter. |

1. ............... 2. ............... 3. ...............

## 3 Put (✓) or (✗) :

1. Ice is considered a solid state of water. ( )
2. Matter never changes from one form to another. ( )
3. Volume is the space that is taken up by a matter. ( )
4. Any matter is made of tiny particles. *(Cairo 2023)* ( )
5. The gas state of water is steam. ( )

## 4 Write the scientific term of each of the following :

1. Anything that has mass and volume. *(Alex. 2023)* (.....................)
2. The state of water after its boiling. (.....................)

## 5 Complete the following sentences :

1. States of matter are ................., ................. and liquid.
2. Iron and gold are examples of ................. state of matter.
3. The state of an ice cube is ................. , while the state of the air we breathe is .................
4. Any matter takes up space means that it has ................. *(Minia 2023)*

## 6 Cross out the odd word :

1. Oil – Milk – Water – Wood. *(Beni Suef 2023)* (.....................)
2. Plastic – Vinegar – Iron – Aluminium. (.....................)
3. Coal – Carbon dioxide – Oxygen – Air. *(Damietta 2023)* (.....................)

## 7 Give a reason for :

Salt is a matter.

.............................................................................................................................

.............................................................................................................................

## 8 What happens to ... ?

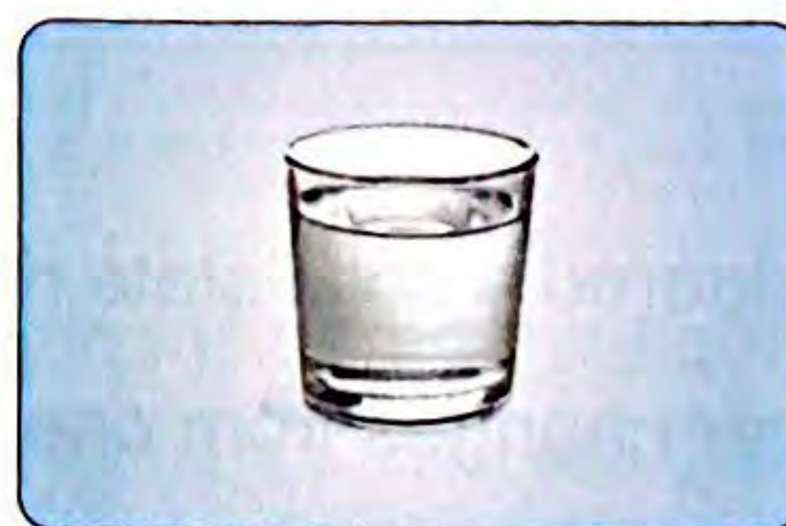
The state of water after it is heated in the kettle for few minutes.

.............................................................................................................................

.............................................................................................................................

## 9 Look at the following pictures that shows two different states of water, then put (✓) or (✗) :


Matter (a)


Matter (b)

1. Matter (b) can change into matter (a). (   )
2. When we boil matter (b), it changes into liquid state. (   )

# LESSON TWO

## Activity 3 Observing Matter

▶ **Look at opposite pictures, then put (✓) or (×):**

1. In cup (1), the wooden cube has fixed shape. (   )
2. In cup (2), water doesn't take space inside the cup. (   )

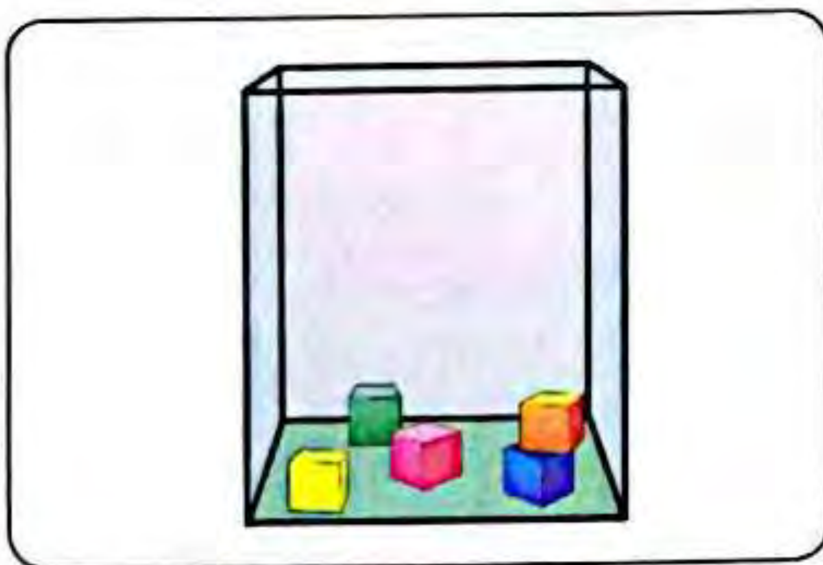

(1)

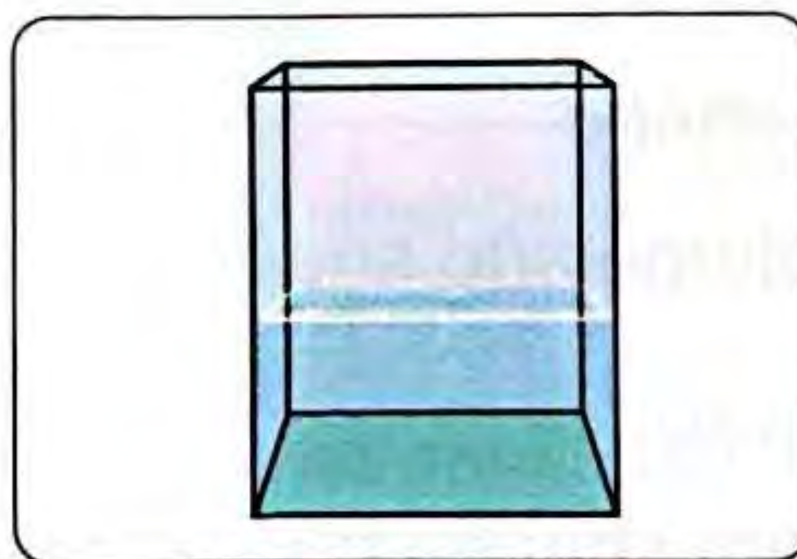

(2)

• In this activity, we will do an experiment to show how to describe the three states of matter (solid, liquid and gas).

### Tools

Three glass containers (A), (B) and (C).


Container (A) contains plastic cubes


Container (B) contains some water


Container (C) contains steam

### Step

Observe the properties of the contents of each container.

### Observations

**In container (A)**, the plastic cube (solid) has definite (fixed) shape and volume.

**In container (B)**, the water (liquid) has no definite shape but it has definite volume.

**In container (C)**, the steam (gas) has no definite shape and volume.

| | | | | | |
|---|---|---|---|---|---|
| definite | واضح / محدد | wooden | خشبي | container | حاوية |

## Conclusions

- **Solids :**
  They have definite (fixed) volume and shape.
- **Liquids :**
  They have definite volume but they don't have definite shape.
- **Gases :**
  They have no definite volume and shape.



**Note**

**Some gases can't be seen such as air, but :**

- You can see air moving when the wind blows and moves some objects.
- You can see a balloon gets larger when you blow air into it.



## Check your understanding

**Put (✓) or (×) :**

1. Liquid matter has definite shape. ( )
2. Gases have no definite volume and shape. ( )

**Choose the correct answer :**

1. .................. matter has definite shape and definite volume.
   **(Solid – Liquid – Gas)**
2. .................. and .................. take the shape of their containers.
   **(Solids, liquids – Solids, gases – Liquids, gases)**

# Activity 4 Matter

**Matter is something that we can**




Such as
**Air**




Such as
**Ball**




Such as
**Flower**

- All matter are made up of very tiny things (particles) that we cannot see with our eyes.
- Particles of all matter are in continous motion.

**Note**

Some matter are too small to see with human eye such as air and germs, but they are also made up of tiny particles.


Germs

## States of matter

**The following table shows the difference between the particles and shape in each state of matter :**

| Solids | Liquids | Gases |
|---|---|---|
| **Particles :**<br>• They are very close to each other (packed tightly).<br>• They have less energy.<br>• They move only a little bit. | **Particles :**<br>• They have more spaces.<br>• They have more energy.<br>• They can move more freely. | **Particles :**<br>• They have a lot of spaces.<br>• They have a lot of energy.<br>• They move very freely. |
| **Shape and volume :**<br>• They have definite shape and volume.<br>• Their shape doesn't change unless something is happening to change them. | **Shape and volume :**<br>• They don't have definite shape but they have definite volume.<br>• They take the shape of their containers. | **Shape and volume :**<br>• They don't have definite shape and volume.<br>• They completely fill their containers and take their shapes. |

| | | | | | |
|---|---|---|---|---|---|
| particles | جسيمات | continous | مستمر | close to | قريب من |
| motion | حركة | germs | جراثيم | packed | مرتبة |
| tightly | بإحكام | | | | |

## Measuring and observing matter

- **Some properties of matter can be measured such as :**



Measuring tape

- We can measure the length of some matter using a ruler or a measuring tape (tape measure).




Balance

- We can measure the mass of some matter using a balance (or scale).



Thermometer

- We can measure the temperature of some matter using thermometer.

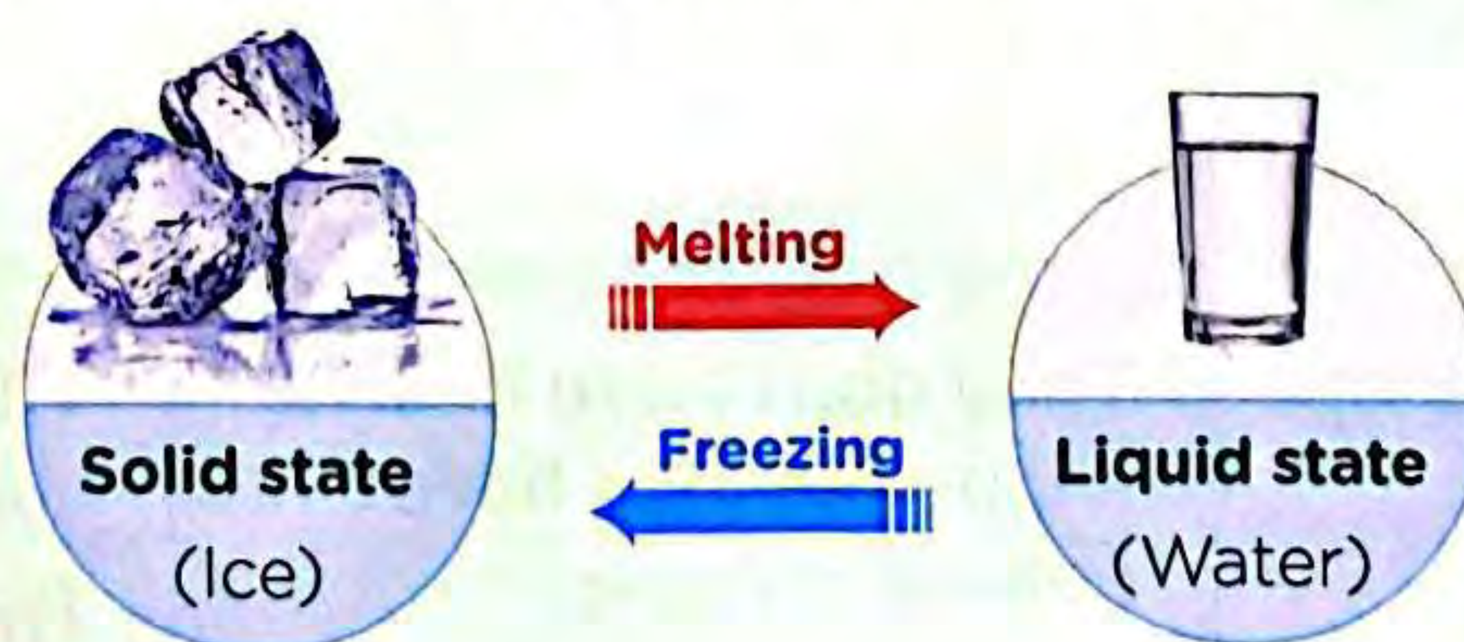
**From the previous explanation,we can determine the state of matter by :**

**1.**Describing the properties of matter.

**2.**The motion of particles of matter.

**Notes**

**1.** Matter can change from one state to another state such as :




**2.** There are something that are not matter such as light and sound which are forms of energy.

**3.** If there are two objects, they cannot take up the same space at the same time.

| | | | |
|---|---|---|---|
| measure | يقيس | measuring tape | شريط قياس |
| scale | ميزان | thermometer | ميزان حرارة/ترمومتر |



## Check your understanding

▶ **Put (✓) or (✗) :**

1. Any matter is made up of tiny particles. ( )
2. Liquids have definite shape. ( )
3. We can measure the length of some matter using thermometer. ( )

▶ **Choose the correct answer :**

1. .................. matter completely fill their containers.

   a. Liquid     b. Gas     c. Solid

2. Particles of ................. have a lot of spaces.

   a. solid     b. liquid     c. gas

**In the Assessment Book :**

**Try to answer :**

Self-Assessment (15)

# Exercises on Lesson 2

● Understand ○ Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. Liquids have definite .......... , but their .......... is not definite.
   a. volume – shape  b. color – volume
   c. shape – volume  d. color – shape
2. Both .......... and .......... are solids as they have definite shape and volume.
   a. wood – oxygen  b. milk – iron
   c. wood – iron  d. milk – oxygen
3. One of the substances that doesn't take the shape of its container is ..........
   a. oil.  b. coin.  c. gasoline.  d. water.
4. Both .......... and .......... take the shape of their container.
   a. air – plastic  b. water – air  c. wood – air  d. water – plastic
5. Gases have .......... shape and .......... volume.
   a. definite – definite  b. no definite – no definite
   c. definite – no definite  d. no definite – definite
6. Particles of .......... are very close to each other. *(Cairo 2023)*
   a. gold  b. steam  c. milk  d. oxygen
7. Particles of all the following substances have a lot of energy, except ..........
   a. water vapor.  b. carbon dioxide.  c. oxygen.  d. plastic.
8. The shape of .......... is fixed as it is a .......... matter.
   a. gold – liquid  b. water – liquid  c. air – gas  d. gold – solid
9. Oil takes the .......... of its container. *(Cairo 2023)*
   a. volume  b. shape  c. color  d. mass
10. If we pour an amount of milk from a container to another one that has a different shape, so the shape of milk will .......... and its volume will ..........
    a. change – change.  b. not change – not change.
    c. change – not change.  d. not change – change.
11. To measure the length of a table, we can use a ..........
    a. thermometer.  b. balance scale.  c. cylinder.  d. measuring tape.

## 2 Choose from column (B) what suits it in column (A) :

| Column (A) | Column (B) |
|---|---|
| 1. Milk | a. its particles are packed tightly. |
| 2. Air | b. its particles have medium energy. |
| 3. Wood | c. its particles move very freely. |
| | d. its particles don't move at all. |

1. ................  2. ................  3. ................

## 3 Put (✓) or (X) :

1. All forms of matter have volume. ( )
2. Liquids don't take the shape of the container that they are placed in. ( )
3. Both gold and milk have definite shape. ( )
4. Gases keep their shape and volume whatever the container changes. ( )
5. While transferring water from one pot to another, its volume will change. ( )
6. Particles of water can move more freely than the particles of water vapor. ( )
7. Particles of all matter are in a continuous motion. ( )
8. Light and sound are forms of matter. ( )
9. Liquid particles move freely more than solid particles. ( )
10. Gasoline takes the shape of its container. ( )
11. Two equal amounts of sugar and salt cannot take up the same space at the same time. ( )

## 4 Write the scientific term of each of the following :

1. The state of matter that has definite volume and shape. (....................)
2. The state of matter that is characterized by having a definite volume but it doesn't have a definite shape. (....................)
3. Substances that take the shape and the volume of their containers. (....................)
4. The state of matter that has a lot of spaces between its particles. (....................)
5. The tool used to measure the length of a wall. *(Damietta 2023)* (....................)
6. The tool used to measure the temperature of some matter. (....................)

## 5 Complete the following sentences :

1. States of matter are ................ , ................ and gas. *(Fayoum 2023)*
2. In the ................ matter, the volume and shape don't change.
3. Water is a matter in ................ state, while water vapor is a matter in ................ state.
4. Matter that takes the shape of its container, but its volume cannot be changed is ................ *(Beni Suef 2023)*
5. We can measure the ................ of a pen by using a ruler.
6. Particles of ................ matter are very close to each other.
7. Any matter is made up of tiny ................ that we cannot see with our eyes.
8. The shape of ................ matter doesn't change unless something is happening to change it.
9. Particles of ................ matter have a lot of energy and spaces.

## 6 Give reasons for :

1. Sugar is a solid matter. *(Cairo 2023)*

..........................................................................................

2. Wood has definite shape and volume.

..............................................................................................................

3. Oxygen has no definite shape or volume. *(Gharbia 2023)*

..............................................................................................................

4. Particles of a piece of iron are very close to each other.

..............................................................................................................

5. Water has different shapes when it is placed in some containers that have different shapes.

..............................................................................................................

..............................................................................................................

## 7 What happens to ...?

1. The shape of water if we put three equal amounts of water in three different containers.

..............................................................................................................

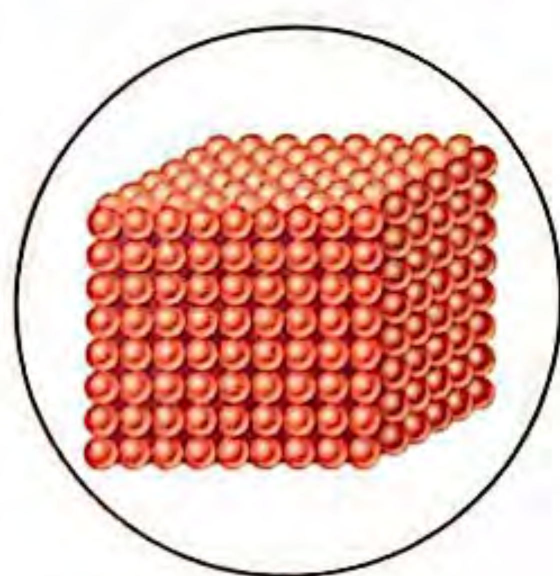
2. The volume of a coin if we move it from a cup to another cup.

..............................................................................................................

3. The shape of water if it changes into ice.

..............................................................................................................

## 8 Study the following figures that represent particles of three states of matter, then put (✓) or (✗) :


Figure (1)

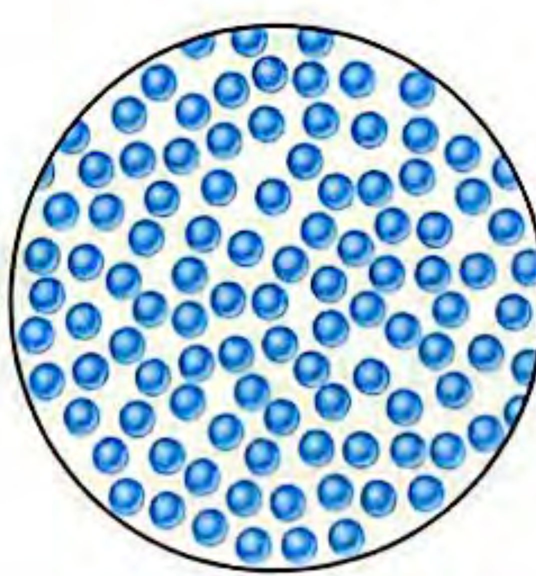

Figure (2)


Figure (3)

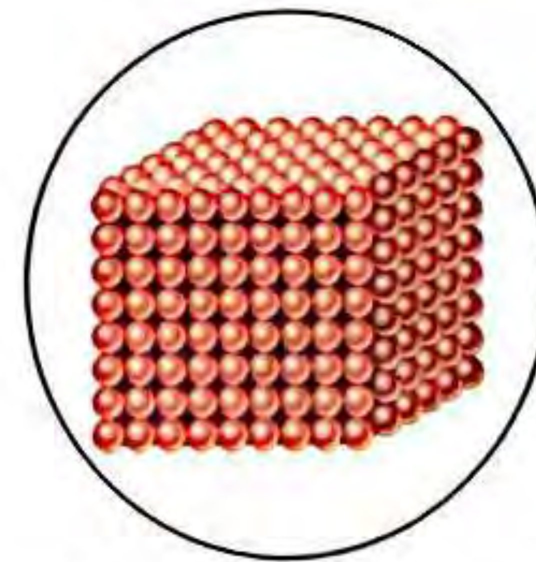
1. Figure (1) represents solid matter. (   )
2. Figure (2) represents liquid matter. (   )
3. By increasing the spaces between the particles of figure (2), this matter changes into solid state. (   )
4. Particles of figure (1) have more energy than particles of figure (3). (   )

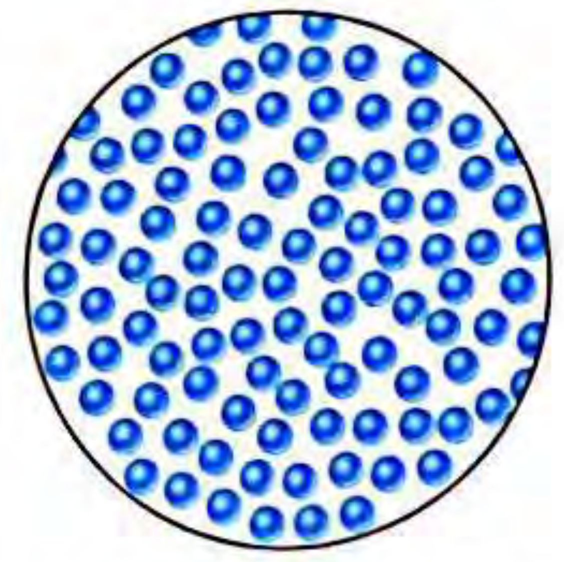
# LESSON THREE

## Activity 5 Particles of Matter

▶ **Look at the opposite pictures, then put (✓) or (×) :**

1. Particles of solid are packed closely together than particles of liquid. ( )
2. Particles of solid take the shape of their containers. ( )


Solid particles


Liquid particles

**You have learned that any matter is made up of tiny particles that we cannot see with our eyes, where :**

- Particles are known as "the building units of matter".
- Normal microscopes help us see some particles of matter.
- Different kinds of matter are made of different kinds of particles such as :
  - Particles of gold are different from particles of iron.
  - Particles of water are different from particles of milk.

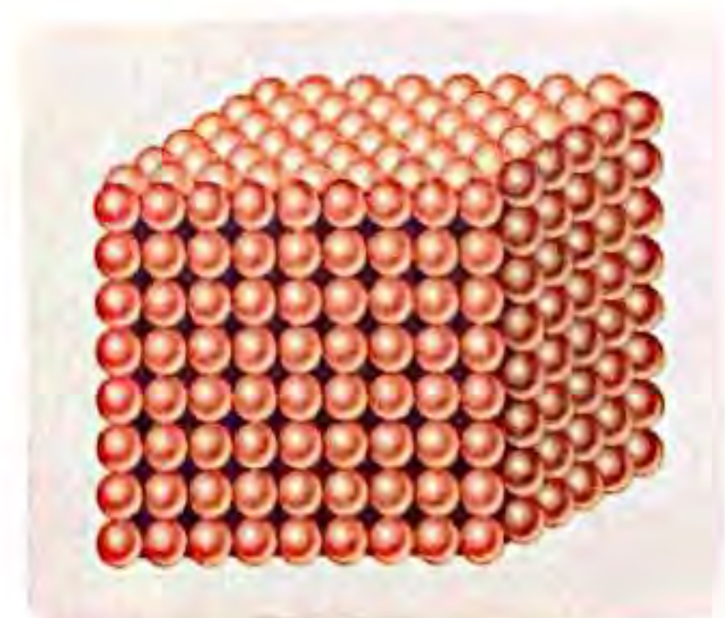

Microscope

▶ **Now,** let's study different kinds of particles.

### Particles of solids

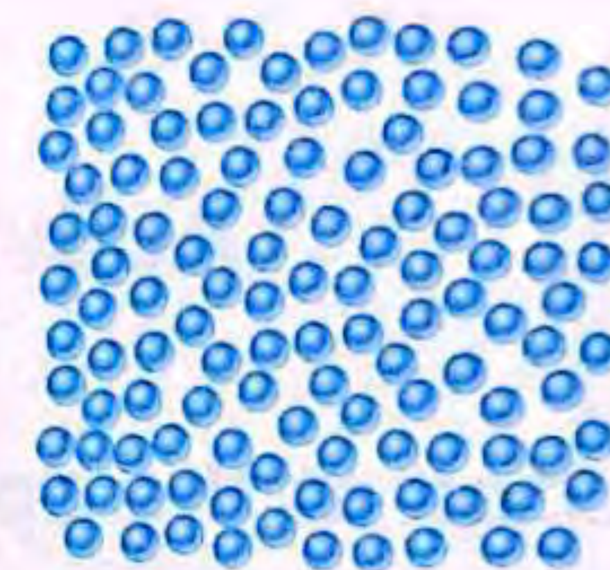
**Particles of solids are closely packed (arranged) together and this leads to :**

- Solids keep their shape.
- When they vibrate or move around their places, these particles are held together, so each particle cannot move separately from one place into another.
- They cannot slide over each other.


Solid particles

| | | | | | |
|---|---|---|---|---|---|
| regular | عادى | vibrate | يهتز | hold | يمسك |
| slide | ينزلق | directions | اتجاهات | separately | منفصلة |
| building unit | وحدة بناء | arranged | مرتبة | | |

## Particles of liquids


Liquid particles

**Particles of liquids are held together more loosely than particles of solids and this leads to :**

- They move faster than solid particles.
- They can slide over each other so, they take the shape of their containers.

## Particles of gases


Gas particles

**Particles of gases are not held together and this leads to :**

- They move very quickly in all directions.
- They can spread out to fill up any container they are put in.



## Check your understanding

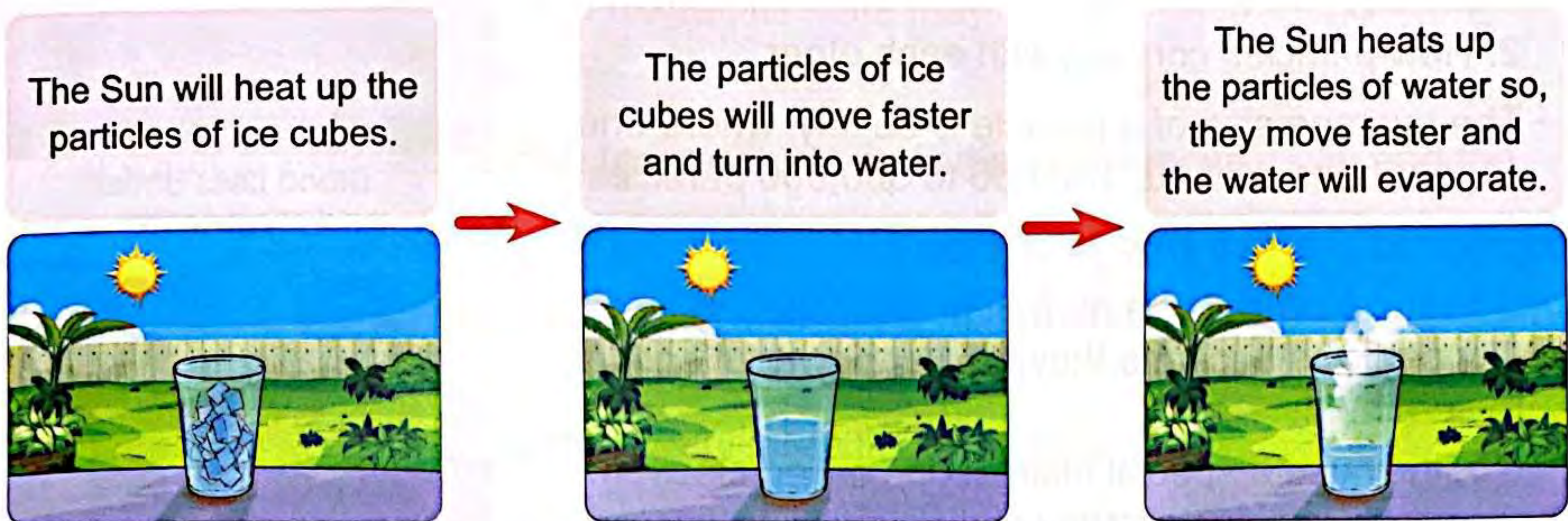
▶ Put (✓) or (✗) :

1. Particles of solids can move freely from one place to another. ( )
2. Liquid particles move faster than solid particles. ( )

| directions | اتجاهات | fill up | يملئ | spread | ينتشر |
|---|---|---|---|---|---|

## Activity 6 Modeling the Particles of Matter

▶ **When a cup of ice cubes placed on a table exposed to the Sun in a hot summer day :**




- Using models is a way to study some scientific concepts easily and can make ideas more clear.
- To make a model of particles that make up a matter, you can use ping pong balls as they are three dimensional units and can be separated from each other.


Ping pong balls

**So,** you can use these balls to describe the movement of particles of the three states of matter.



### Check your understanding

▶ **Choose the correct answer :**

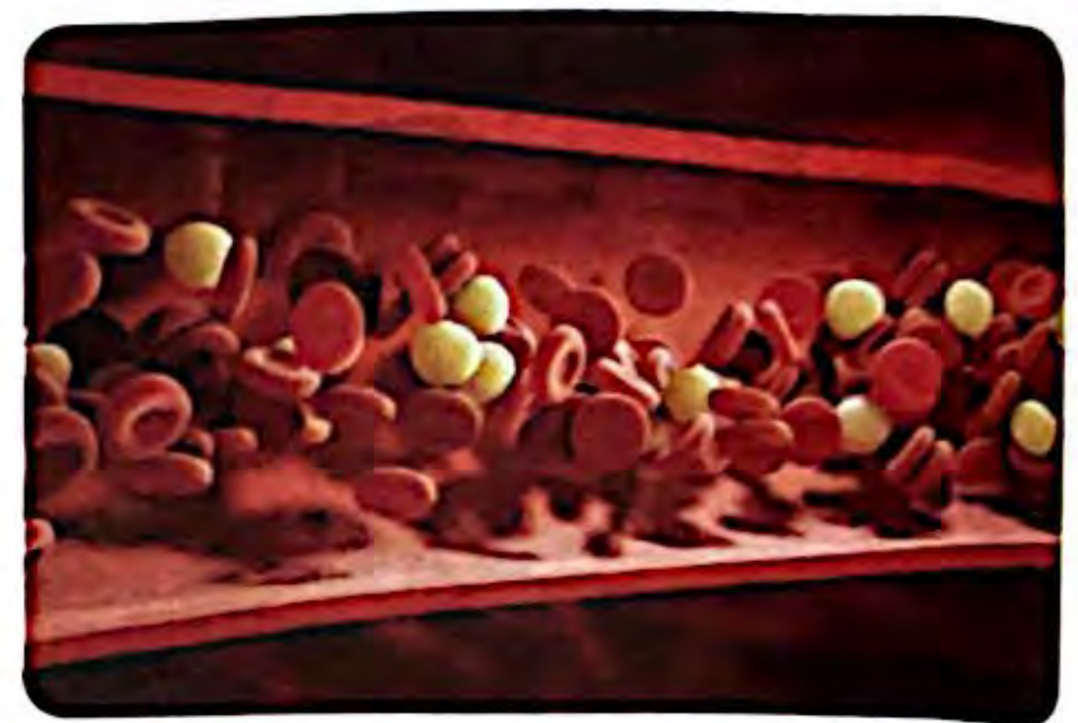
1. When you heat a solid matter, the movement of its particles ..................
   **(becomes slower – becomes faster – doesn't change)**
2. If you heat a liquid matter, it will change into .................. matter.
   **(liquid – solid – gas)**

| | | |
|---|---|---|
| heat up يسخن | three-dimensional ثلاثى الأبعاد | model نموذج |
| evaporate يتبخر | ideas أفكار | |

# Activity 7 Tiny Particle Size

## Tiny particles size

- The size of particles depends on :
  1. The type of particles.
  2. How particles connect with each other.
- The average size of a particle is so tiny, where one of your hairs is about 150,000 to 300,000 particles.



Blood cells under a microscope

### ▶ How can we see tiny particles ?

- Scientists cannot use normal microscopes to see tiny particles because they are not powerful enough to see them.
  **So,** they use a special microscope called electron microscope to see one tiny particle such as (one blood cell).



Electron microscope

### ▶ How can we show that particles exist ?

- To show that the invisible particles are really exist, we can use a gas matter such as air which is made up of invisible tiny particles as follows :

| When you blow up a balloon | When you squeeze a balloon |
|---|---|
| • The particles of air inside the balloon move very quickly.<br>• The particles of air hit and bounce off the balloon from inside, so they produce a force that inflates the balloon and gives it a round shape. | • The particles come close together so, the balloon becomes smaller.<br>• If you squeeze more on the balloon, it will pop and the particles of air inside the balloon will escape out into the air. |



## Check your understanding

▶ **Put (✓) or (✗) :**

1. To see the components of a tiny particle, we need electron microscope. (   )
2. When you blow up a balloon, the air particles inside the balloon move very quickly. (   )

**In the Assessment Book :**
**Try to answer :**
Self-Assessment 16

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| average | متوسط | invisible | غير مرئى | inflate | ينفخ | blood cells | خلايا الدم |
| exist | موجود | squeeze | يضغط | hit | يصطدم | enough | كاف |
| powerful | قوى | components | مكونات | pop | يفرقع / ينفجر | round | دائرى |
| bounce | يرتد / ينعكس | escape | يهرب | | | | |

# Exercises on Lesson 3

● Understand ○ Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. By changing the .......... of a matter, its state may change.
   a. mass b. volume c. color d. temperature

2. If water is exposed to high temperature, its particles will move .......... and the water may change into .......... *(Damietta 2023)*
   a. faster – ice.
   b. faster – water vapor.
   c. slower – ice.
   d. slower – water vapor.

3. We can use a model to study very large things such as ..........
   a. solar system.
   b. germs.
   c. microbes.
   d. viruses.

4. By blowing up a balloon, ..........
   a. its volume decreases.
   b. its volume increases.
   c. its color changes.
   d. its mass doesn't change.

5. To examine the structure of tiny particles of a matter, we can use ..........
   a. microscopes.
   b. balances.
   c. thermometers.
   d. rulers.

6. Particles of .......... vibrate around their places. *(Alex. 2023)*
   a. glass b. air c. oxygen d. water

7. The movement of particles of water is slower than that of ..........
   a. wood. b. plastic. c. air. d. gold.

8. The liquid matter is characterized by all the following, except that ..........
   a. its particles move faster than solid particles.
   b. its particles move slower than gas particles.
   c. its particles can't spread to fill up any container they are put in.
   d. its particles are held together more closely than solid particles.

## 2 Put (✓) or (✗) :

1. Germs are very large organisms that can be seen with the naked eye. ( )
2. Ping pong balls can be used to make a model of particles as they are three dimensional units. ( )

3. Air particles are visible as they are very large particles. ( )
4. To see components of one particle such as a blood cell, we can use the normal microscope. ( )
5. By squeezing a balloon, the space that the gas particles can occupy will decrease. ( )
6. The type of particles affects their size. ( )
7. Liquid particles move freely more than solid particles. *(Giza 2023)* ( )
8. Some particles of matter can be examined by normal microscopes. ( )
9. The speed of water vapor particles is slower than that of water particles. ( )
10. particles of wood are different from particles of plastic. ( )

## 3 Write the scientific term of each of the following :

1. The state of water after its heating for a high temperature. (.....................)
2. A device used to examine one tiny particle such as a blood cell. (.....................)
3. A device used to examine objects that are too small to be seen with the naked eye. *(Qena 2023)* (.....................)

## 4 Complete the following sentences :

1. When an ice cube is exposed to the Sun, the speed of movement of its particles will ..................
2. Water evaporates when it is exposed to a .................. temperature.
3. We can use ping pong balls to describe the movement of .................. of the three states of matter.
4. To describe the particles of a matter in .................. state by modeling balls, we should put the balls packed together.
5. Scientists cannot use the .................. microscope to see the components of one blood cell.
6. Particles of liquid matter can move more faster than particles of .................. matter and more slower than particles of .................. matter.
7. Particles of .................. matter can slide over each other, so they take the .................. of their containers. *(Luxor 2023)*

## 5 Give reasons for :

1. Using models to study some scientific concepts.

.................................................................................................................................

2. Sometimes we need to use an electron microscope.

.................................................................................................................................

3. Particles of gases can spread out quickly to fill up any container they are put in.

.................................................................................................................................

4. Liquids take the shape of their containers. *(Qalyoubia 2023)*

.................................................................................................................................

## 6 What happens to ... ?

1. The speed of particles of an ice cube when it is exposed to the Sun.

.................................................................................................................................

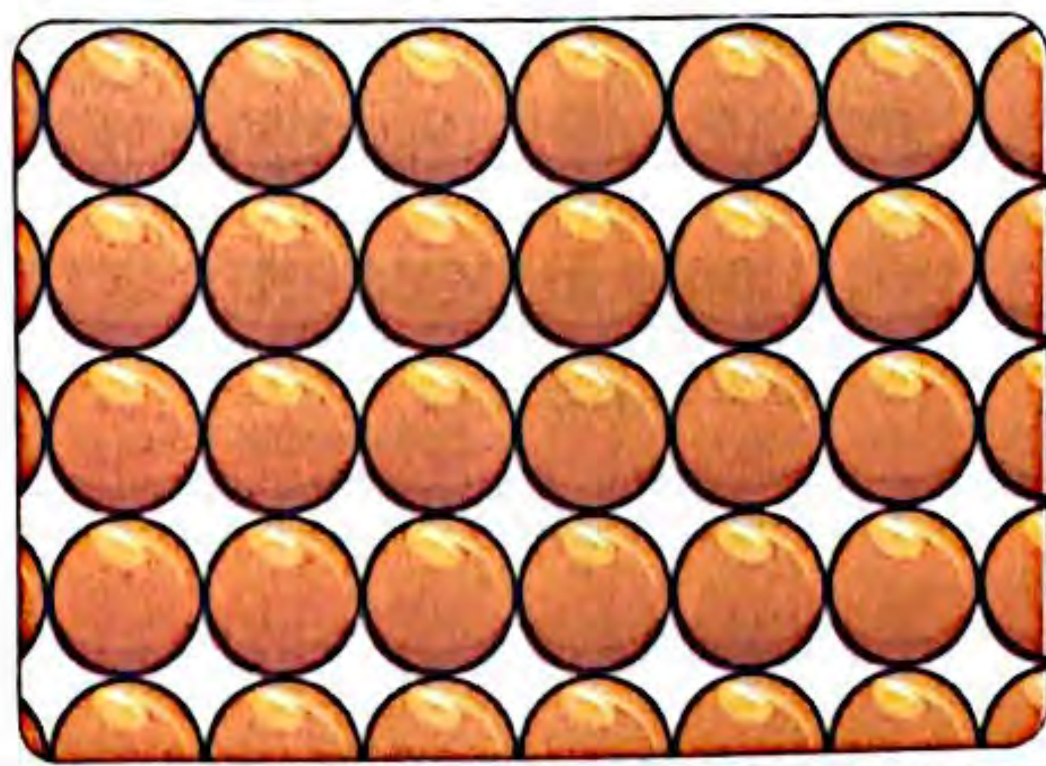
2. The size of a balloon when you blow it up.

.................................................................................................................................

3. The speed of particles of liquid when it changes into gas. *(Alex. 2023)*

.................................................................................................................................

## 7 Look at the opposite ball model that shows the particles of a matter, then complete the following sentences :



1. This model represents a substance in ................. state.
2. If we want to make changes in this model to make this matter in a liquid state, we should ................. the distances between balls.

## 8 Look at the opposite figures that represent the three states of matter, then complete the following sentences :

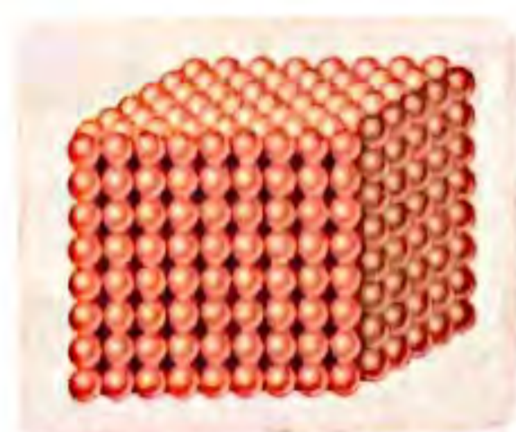


Figure (A)

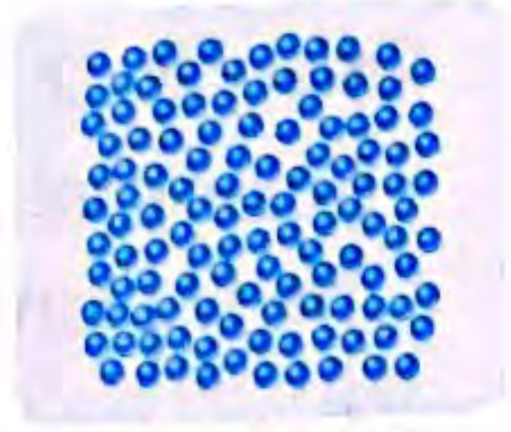


Figure (B)



Figure (C)

1. Matter in figure ................. takes the shape of its container but its volume doesn't change.
2. Particles of figure ................. move faster than that of figure ................. and figure .................
3. Particles of figure ................. are not held together.

# LESSON FOUR

## Activity 8 Models

▶ **Look at the opposite picture, then put (✓) or (×) :**


Globe

**1.** This model represents the moon. ( )

**2.** This model help us see all of land and water areas on Earth at once. ( )

### Models

**Model :**

It is a copy that is similar to a real.

- Models help us understand things we cannot easily see.
- Models may be drawings, objects or ideas that represent a real event, object or process.
- Models look like, move like or work like what they copy.

### How do models help us look at big things ?

Models can represent very big things in a smaller size, because it is hard to see them.

▶ **Now,** let's study two examples of models for very big things.

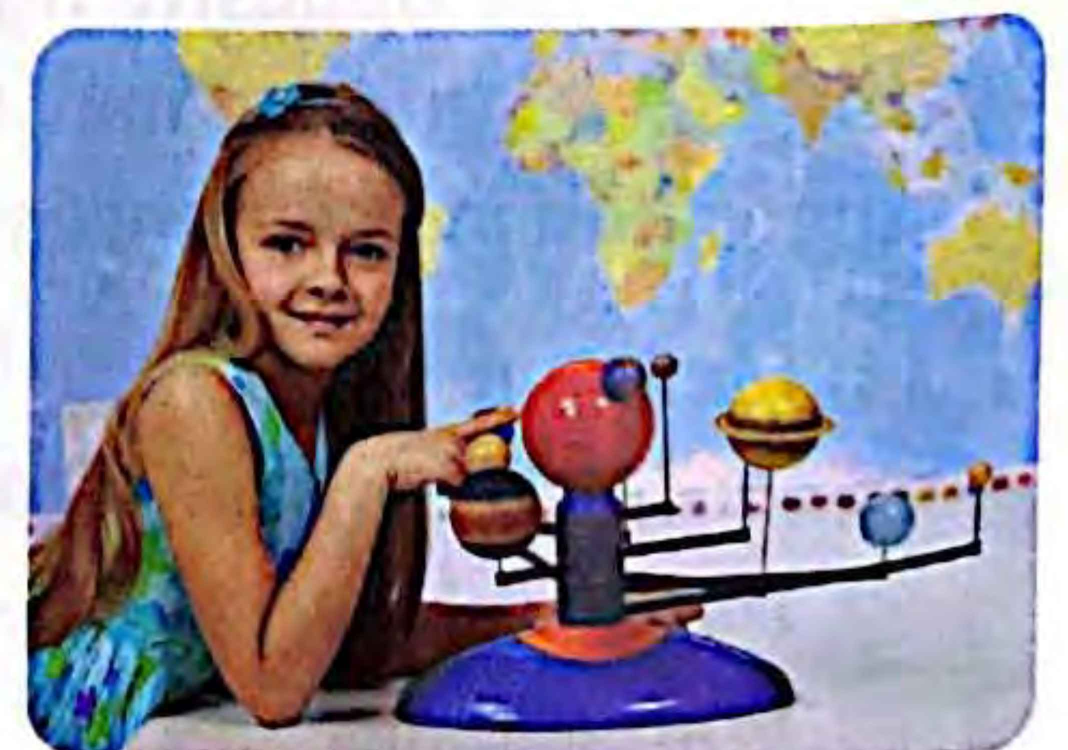
Example (1) : **Earth :**

- We cannot see all of Earth while we are standing on it because it is too big.
- **A globe represents a model of Earth which shows us :**
  - The shape of Earth.
  - How much of Earth is covered with water.
  - Where different countries are located.


Globe

Example (2) : **The solar system :**

- Solar system is a very big place that consists of many planets such as Earth.
- **A model of the solar system helps us :**
  - See all planets at once.
  - Compare between planets, which one is the biggest and which one is the closest to Earth.


Model of solar system

| | | | | | |
|---|---|---|---|---|---|
| copy | نسخة | globe | نموذج للكرة الأرضية | real | حقيقي |
| event | حدث | process | عملية | countries | دول |
| locate | يقع | stand | يقف | planets | كواكب |

## How do models help us look at small things ?

- Models can represent very tiny things in a bigger size, because it is hard to see them such as germs.
- Germs are spread around us which make us sick and we can only see them with a microscope.
- **A model of a germ helps us :**
  - See the shape of a germ without microscope.
  - See different parts of germs which help them spread from one person to another.



Model of a germ

## Models help us understand how things work

Example (1) : **A model of a volcano :**

- **A model of a volcano shows us :**
  - The shape of a volcano.
  - How the liquid that comes out of a volcano during a real eruption.



Model of volcano

Example (2) : **A model of an airplane :**

**A model of an airplane shows us** how it flies up into the air.



Model of airplane

**From the previous explanation, it is clear that models help us :**

- Teach something about the real things they copy.
- See and understand how things work.
- Learn about many things at just the right size.
- Know what we could not otherwise see.



## Check your understanding

**Put (✓) or (✗) :**

1. The globe shows where different countries are located. ( )
2. To study germs we need to bring model of them in big suitable size. ( )

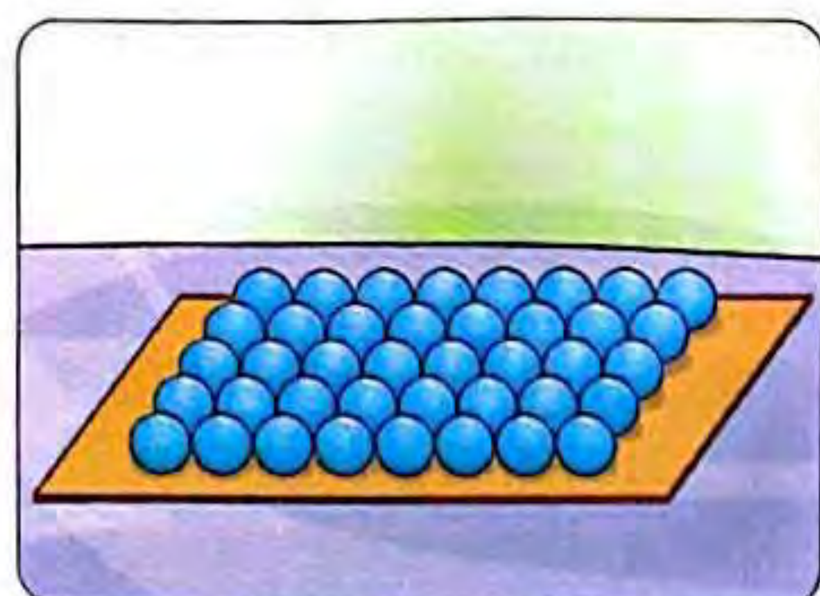
| | | | |
|---|---|---|---|
| sick | مريض | eruption | ثوران |
| spread | ينتشر | volcano | البركان |

## Activity 9 Modeling States of Matter

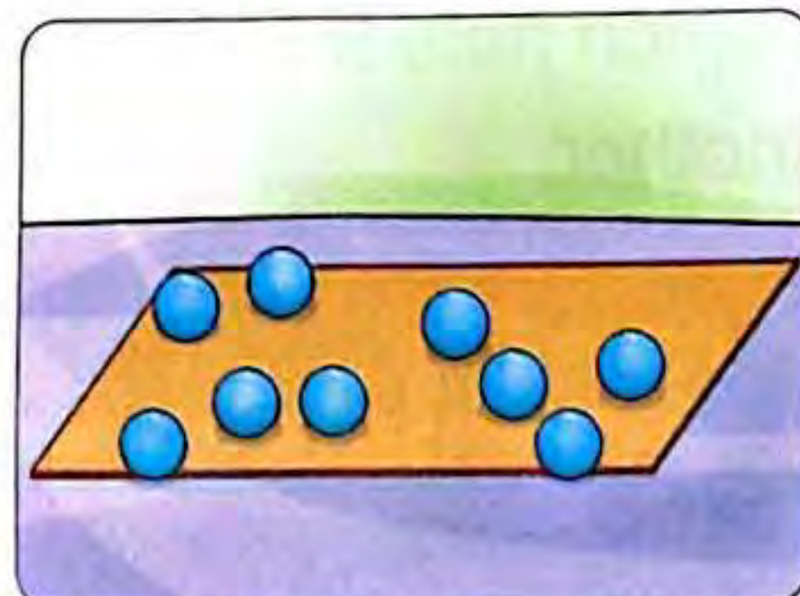
▶ **In this activity, we will observe three models that show the arrangement of particles in each state of matter.**

### ▶ Tools

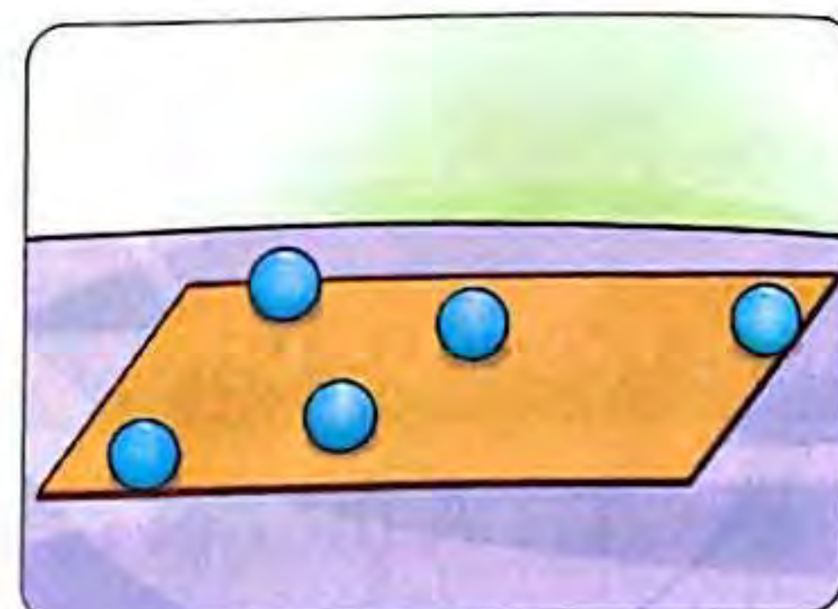
Beads fixed by glue on three pieces of cardboard which represent the different arrangement of particles in each state of matter.



Model of a solid



Model of a liquid



Model of a gas

### ▶ Step

Observe the three models of the three states of matter and the arrangement of particles in each state.

### ▶ Observations

The arrangement of beads in :

- Model of a solid : Beads are close together and arranged in a regular pattern.
- Model of a liquid : Beads are little far from each other and not arranged in a pattern.
- Model of a gas : Beads are so far from each other and not arranged in a pattern.

### ▶ Conclusions

The arrangement of particles in :

- **Model of a solid :** They have a regular pattern (organized).
- **Model of a liquid :** They have a random arrangement (not well organized).
- **Model of a gas :** They have a random arrangement (not organized at all).



## Check your understanding

▶ **Put (✓) or (✗) :**

1. Particles of gas matter are organized. (   )
2. Particles of solid matter are close together and have a regular pattern. (   )

**In the Assessment Book :**
**Try to answer :**
Self-Assessment (17)

| | | | | | |
|---|---|---|---|---|---|
| beads | خرز | arrangement | ترتيب | regular | منتظم |
| organized | منظم | pattern | نمط | fixed | مثبت |
| random | عشوائي | | | | |

# Exercises on Lesson 4

● Understand ○ Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. The model of Earth shows how much of its surface is covered with ...........
   a. gasoline. b. water.
   c. milk. d. animals.
2. We can see all planets of the ........... system including Earth by using a model.
   a. solar b. digestive
   c. respiratory d. muscular
3. Some liquids come out of a ........... during its eruption.
   a. star b. wooden piece
   c. volcano d. plastic piece
4. Particles of ........... are organized and have a regular pattern. *(Cairo 2023)*
   a. solids only b. gases only
   c. solids and liquids d. liquids and gases
5. Gases differ from solids and liquids in that gases ...........
   a. can be poured. b. fill any container they are put in.
   c. have a definite shape. d. have a definite volume.

## 2 Put (✓) or (✗) :

1. Models don't help us understand things that we cannot easily see with our eyes. ( )
2. Solar system contains only one planet which is Earth. ( )
3. Models help us understand ideas, objects or processes. ( )
4. We can see the shape of a germ by using a special microscope. ( )
5. Most germs can spread around us and may make us sick. ( )
6. A model of an airplane shows us how it flies up into the air. *(Giza 2023)* ( )

## 3 Write the scientific term of each of the following :

1. A model of the whole Earth that is made in the shape of a large ball. (.....................)
2. A copy that is similar to a real thing which we cannot observe it with our eyes. *(Fayoum 2023)* (.....................)

**4 Complete the following sentences :**

1. Water vapor particles are loosely packed, so that water vapor do not have definite .................. or ..................
2. Earth is a planet in the .................. system.
3. We can study the location of countries by using a .................. which represents a model of Earth.
4. A model of a germ helps us see its shape without using a .................. which is used to magnify tiny objects. *(Suez 2023)*
5. Liquids that come out of a volcano have definite .................. but they have no definite ..................

**5 Give a reason for :**

Scientists make models of germs.

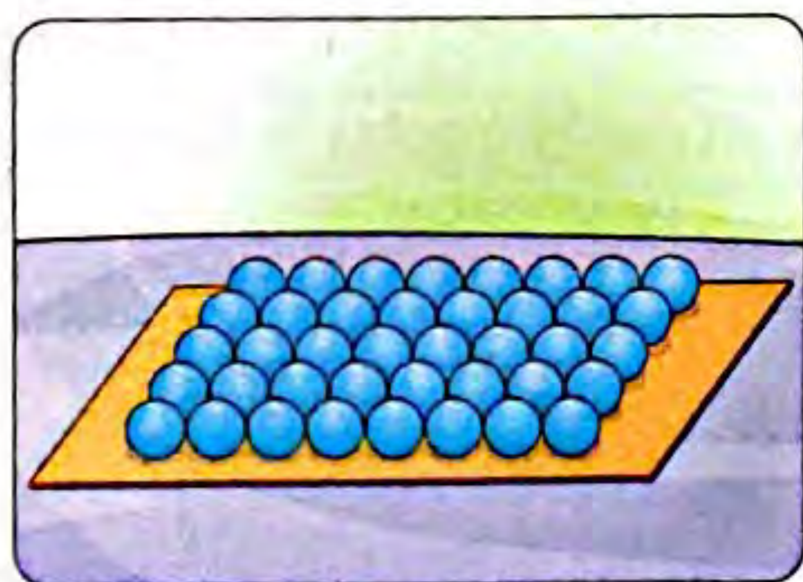
..................................................................................................................................................

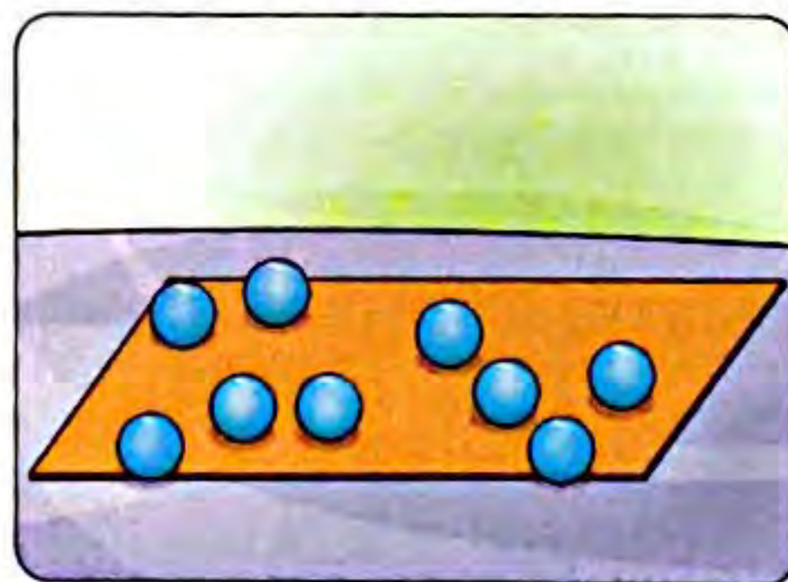
**6 What happens to ... ?**

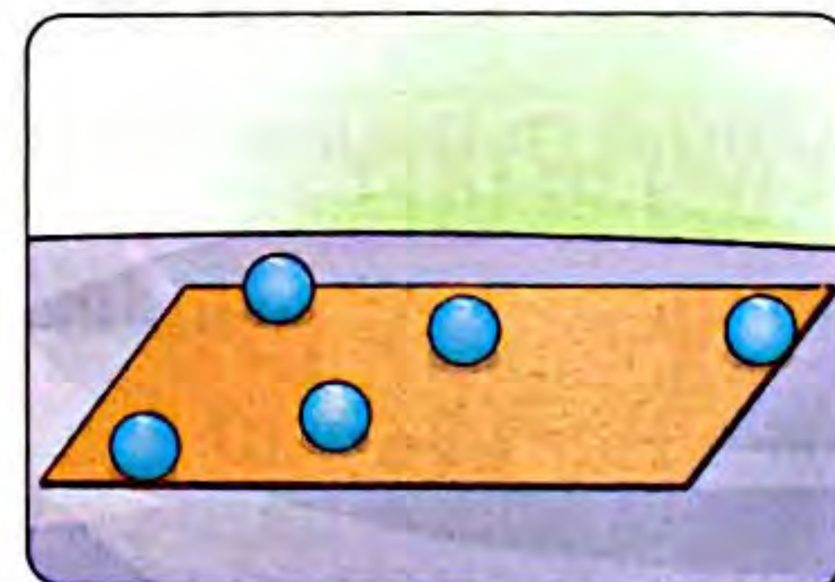
The arrangement of particles of water after its freezing. *(Aswan 2023)*

..................................................................................................................................................

**7 Look at the following figures that show three models of particles of some matter related to our planet Earth, then complete the following sentences :**


Figure (1)


Figure (2)


Figure (3)

1. Beads of figure .................. could represent the particles of a rock on Earth's surface.
2. Beads of figure .................. could represent the particles of river water on Earth.
3. Beads of figure .................. could represent the particles of air that surrounds Earth.
4. By heating the particles of figure (2), they will be similar to that of figure ..................

## Activity 10 Record Evidence Like A Scientist

- In this concept, you have learned a lot about the three states of matter and the properties of each state.
- **Now,** try to think like a scientist by writing your claim, your evidence and your scientific explanation about one of the main points of this concept through the four steps you have learned in the previous concepts.

### Step 1 The Question

What are the different forms of matter that can be found in the world around us ?

### Step 2 My Claim

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

### Step 3 My Evidence

..................................................................................................................................

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..................................................................................................................................

..................................................................................................................................

### Step 4 My Scientific Explanation

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

| | | | |
|---|---|---|---|
| claim | فرضية | evidence | دليل |
| scientific explanation | تفسير علمى | | |

# Activity 11 STEM in Action

## Careers and states of matter

**We use the three states of matter to prepare and cook different types of food such as :**

| Solid matter | Liquid matter | Gas matter |
|---|---|---|
| • Rice.<br>• Pasta.<br>• Frozen vegetables. | • Water.<br>• Oil.<br>• Vinegar. | • Natural gas used in gas ovens.<br>• Steam of boiling water. |

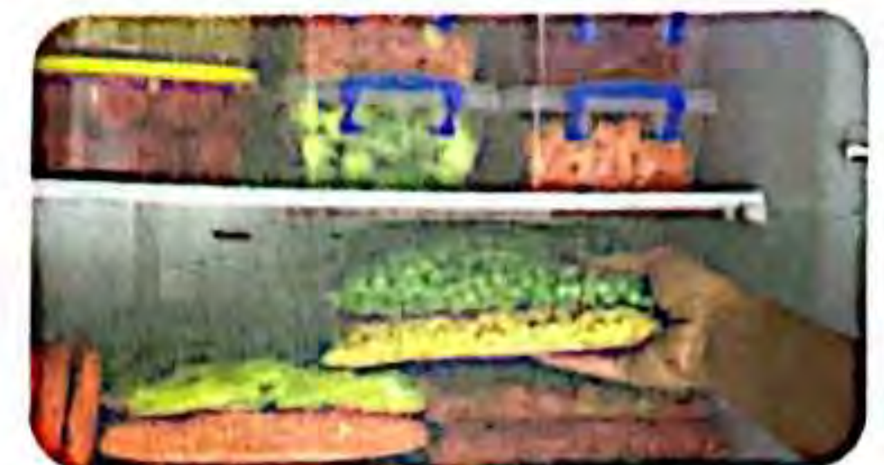
## Scientist chef

- Chefs use science during preparing dishes.
- **Chefs use different states of matter to change ingredients such as :**

1. Boiling some water to cook pasta or rice, where water (liquid state) changes into steam (gas state).



2. Freezing vegetables keep them fresh and ready to use for longer periods of time.



3. Leave a cup of juice or milk in freezer to change from liquid state into solid state.





## Check your understanding

▶ **Put (✓) or (×) :**

1. When we boil some water to cook pasta, it changes from solid state into gas state. (    )
2. When we leave a cup of water in freezer, it changes into solid state. (    )

## Review on Concept [2 - 1]

To review this concept look at the **Assessment Book** "Part 2 : Final Revision".

**In the Assessment Book :**
**Try to answer :**
- Self-Assessment (18)
- Model Exam on Concept (2.1)

| | | | | | |
|---|---|---|---|---|---|
| rice | أرز | pasta | مكرونة | frozen | مجمدة |
| ingredients | مكونات | fresh | طازج | careers | وظائف |
| scientist | عالم | | | | |

# Exercises on Lesson 5

● Understand ● Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. When we keep water inside the freezer, the state of water changes from ........... into ...........
   a. liquid – gas. b. liquid – solid. c. solid – liquid. d. gas – liquid.
2. All the following are liquid matter that are used in preparing food, except ...........
   a. water. b. vinegar. c. oil. d. rice.
3. You can see ........... different states of matter in this picture.
   a. two b. three
   c. four d. five



4. A ........... and ........... are examples of solids. *(Giza 2023)*
   a. chair – ice b. juice – ice c. ruler – steam d. bottle – milk

## 2 Put (✓) or (✗) :

1. Frozen vegetables have definite shape. ( )
2. Steam from boiling water is considered the gas state of water. ( )
3. Natural gas used in gas oven has definite shape and volume. ( )

## 3 Complete the following sentences using words below :

**(solid – liquid – gas – space – containers – particles)**

1. The state of matter that has definite volume, but it doesn't have definite shape is .................. *(Behira 2023)*
2. Volume is the amount of .................. that matter takes up.
3. We can classify the types of matter into liquid, .................. and ..................
4. Matter is made up of tiny ..................
5. Liquids take the shape of their .................. *(Cairo 2023)*

## 4 Give a reason for :

Oil used in cooking is considered as an example of liquid matter.

..........................................................................................

..........................................................................................

## 5 What happens to ...?

The state of milk if we put small amount of it in the freezer for few hours.

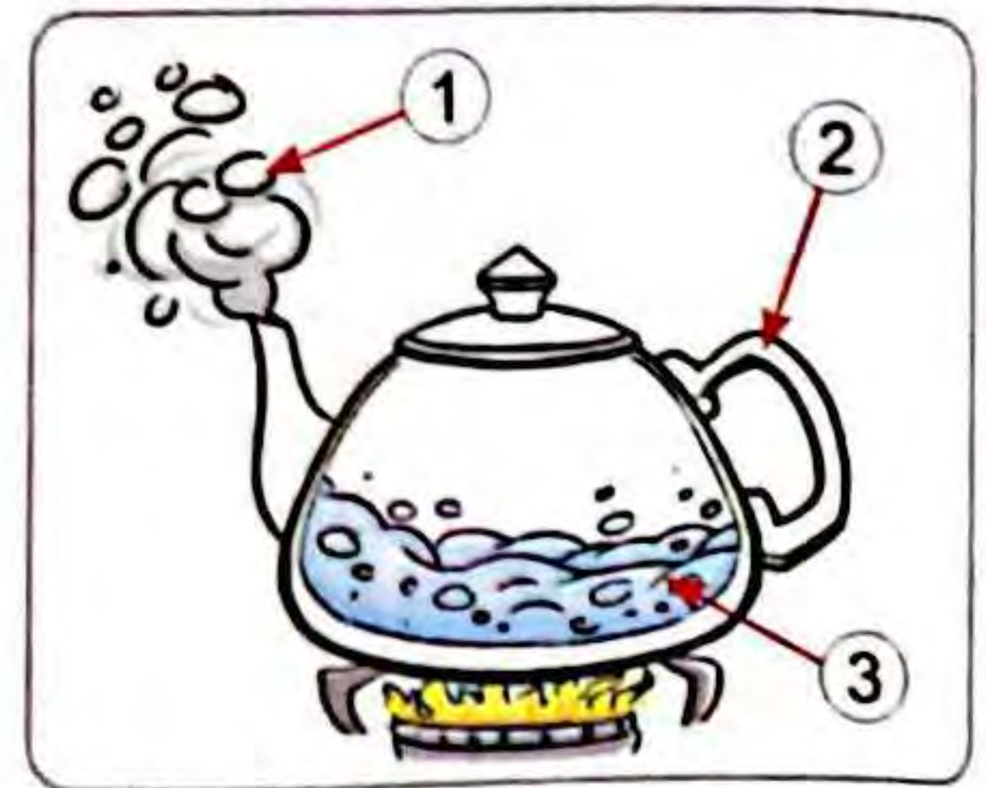
*(Qena 2023)*

.................................................................................................................................

.................................................................................................................................

## 6 Look at the opposite figure, then put (✓) or (✗) :

1. Label ① refers to a matter in liquid state. ( )
2. Label ② refers to a matter in solid state. ( )
3. Label ③ refers to a matter that its shape and volume don't change. ( )
4. Particles of matter ① move slower than particles of matter ③. ( )



# Model Exam 1 on Concept (2.1)

Total mark
15

**1 (A) Complete the following sentences :** *(5 marks)*

1. Iron and gold are examples of ................. state of matter.
2. Matter that takes the shape of its container, but its volume cannot be changed is .................
3. Any matter is made up of tiny ................. that we cannot see with our eyes.
4. Scientists cannot use the ................. microscope to see the components of one blood cell.

**(B) Give a reason for :**

Oil has different shapes when it is placed in some containers that have different shapes.

..........................................................................................................................................

..........................................................................................................................................

**2 (A) Put (✓) or (✗) :** *(5 marks)*

1. We can understand things that we cannot easily see with our eyes by using models. (  )
2. Steam of boiling water is considered the gas state of water. (  )
3. Matter never changes from one form into another. (  )
4. Light and sound are forms of matter. (  )

**(B) Cross out the odd word :**

1. Oil – Milk – Water – Wood. (....................)
2. Plastic – Vinegar – Iron – Aluminium. (....................)

**3 (A) Write the scientific term of each of the following :** *(5 marks)*

1. The tool used to measure the length of a wall. (....................)
2. The building unit of matter. (....................)
3. A device used to examine objects that are too small to be seen with the naked eye. (....................)
4. The state of water after its heating for high temperatures. (....................)

**(B) Choose from column (B) what suits it in column (A) :**

| (A) | (B) |
|---|---|
| 1. Carbon dioxide<br>2. Sand | a. is a solid matter.<br>b. is a liquid matter.<br>c. is a gas matter. |

1. .................. 2. ..................

# Model Exam 2
## on Concept (2.1)

Total mark
15

**1 (A) Choose the correct answer :** *(5 marks)*

1. .......... and .......... are examples of solids.
   a. Chair – ice
   b. Juice – ice
   c. Ruler – steam
   d. Bottle – milk
2. The amount of space that a matter takes up is called ..........
   a. volume.
   b. mass.
   c. weight.
   d. area.
3. One of the substances that doesn't take the shape of its container is ..........
   a. oil.
   b. coin.
   c. gasoline.
   d. water.
4. Particles of .......... vibrate around their place.
   a. glass
   b. air
   c. oxygen
   d. water

**(B) What happens to ...?**

The size of a balloon when you blow it up.

..........................................................................................

..........................................................................................

**2 (A) Complete the following sentences :** *(5 marks)*

1. Particles of ................ matter are very close to each other.
2. Particles of ................ matter can slide over each other, so they take the ................ of their containers.
3. A model of a germ helps us see its shape without using a ................ which is used to magnify tiny objects.
4. When we leave a cup of jucice in freezer, it changes from liquid state into ................ state.

**(B) Give a reason for :**

Scientists make models of germs.

..........................................................................................

..........................................................................................

**3** **(A) Write the scientific term of each of the following :** *(5 marks)*

1. A device used to examine one tiny particle such as a blood cell. (......................)
2. A copy that is similar to a real thing which we cannot observe with our eyes. (......................)
3. The state of water after its freezing. (......................)
4. The state of matter that has a lot of spaces between its particles. (......................)

**(B) Choose from column (B) what suits it in column (A) :**


| (A) | (B) |
|---|---|
| 1. Milk | a. Its particles are packed tightly. |
| 2. Air | b. Its particles have medium energy. |
| | c. Its particles move very freely. |

1. ................... 2. ...................

Concept 2.2

# Describing and Measuring Matter





## Learning outcomes

**By the end of this concept, your child will be able to :**

- Classify materials based on their properties and describe patterns in the properties of similar materials.
- Choose the appropriate tools to measure the size and volume of different kinds of materials in different states of matter.
- Plan and conduct investigations to gather and record information about the properties of various materials.
- Analyze data to identify unknown materials.

## Key vocabulary

- Mass
- Material
- Matter
- Measure
- Property
- Substance
- Volume

# **Notes For Parents** On Concept [2.2]

| Lessons | Activities | What you should do with your child |
|---|---|---|
| 1 | Activity 1 | Explain to your child how matter is described and measured. |
| | Activity 2 | Discuss with your child the kinds of materials which people use to make roofs of homes and buildings. |
| | Activity 3 | Explain to your child how to describe and measure matter. |
| 2 | Activity 4 | Let your child think about the differences between the physical properties of matter. |
| 3 | Activity 5 | Explain to your child the physical properties and chemical properties of matter. |
| | Activity 6 | Let your child think about how to measure different physical properties of matter. |
| | Activity 7 | Apply with your child what he/she has learned about measuring matter. |
| 4 | Activity 8 | Discuss with your child about the useful properties of materials. |
| | Activity 9 | Let your child think about uses of some matter and their properties. |
| | Activity 10 | Help your child to think like a scientist by answering a question about one of the main points of this concept then write his/her claim, evidence and the scientific explanation. |

# LESSON ONE

## Activity 1 Can You Explain ?



▶ **In the previous concept, you have learned about matter and its states.**

▶ **How is matter described and measured ?**

- Matter can be described by its color, shape, texture or size.
- We can also describe matter based on its state (solid, liquid or gas).
- We can measure some properties of matter using some tools like :

  - A balance to measure its mass.
  - A ruler to measure its length.
  - A thermometer to measure its temperature.

▶ **In this concept, we will study :**

- Describing and measuring matter.
- Properties of matter.
- Measuring matter.
- Uses of matter.

| | | | | | |
|---|---|---|---|---|---|
| describe | وصف | size | حجم | balance | ميزان |
| length | طول | thermometer | ميزان الحرارة / ترمومتر | temperature | درجة الحرارة |

## Activity 2 A Roof for Every Type of Climate

▶ **Look at the following pictures, then choose the correct answer :**

Rain or snow cannot enter the home through the roof of ..................

( home Ⓐ – home Ⓑ )



Home Ⓐ



Home Ⓑ

▶ **In this activity we will know some kinds of materials which people use to make roofs of homes and buildings.**

| | Material of the roof | Properties of roof material |
|---|---|---|
| Desert home | Made of strong stones. | - It is flat.<br>- It protects the home from dust and dirt. |
| Cold weather home | Made of ceramic tiles (ceramic bricks). | - It is slanted (inclined).<br>- It protects the home from rains. |
| Tropical rainforest home | Made of leaves and sticks. | - It is slanted (inclined).<br>- It protects the home from animals getting inside. |

| | | | | | |
|---|---|---|---|---|---|
| roof | سقف | tropical rainforest | الغابات الأستوائية المطيرة | desert | صحراء |
| flat | مسطحة | dust | غُبار | dirt | تراب |
| ceramic tiles | بلاط السيراميك | stick | عصا | inclined | مائل / منحدر |
| slanted | مائل | | | | |



**Note**

The kind of material used to make a roof depends on the climate where the home is located.



## Check your understanding

▶ **Put (✓) or (×) :**

1. The desert home roof made of leaves and sticks. (   )
2. Roofs of buildings protect them from rain, animals, dust, dirt or other things getting inside. (   )
3. The tropical rainforest home has a flat roof. (   )

▶ **Choose the correct answer :**

1. The roof of desert home is made of .....................
   a. ceramic tiles. b. leaves and sticks.
   c. strong stones. d. ceramic bricks.
2. The kind of material used to make a roof depends on the ..................... where the home is located.
   a. height b. climate c. location d. length

| material | مادة | climate | مناخ | located | تقع | bricks | طوب |
|---|---|---|---|---|---|---|---|

## Activity 3 What Do you Already know About Describing and Measuring Matter ?

- Everything around us is made of matter, now we will learn about how to describe and measure matter.

### Describing matter

- You already know what is the matter and it could be a solid, a liquid or a gas.
- Matter can be described by its color, shape, odor, texture and size.

### Measuring matter

- Each property of material can be measured by using a special measuring tool.
- The following table shows some properties of matter and the measuring tool used to measure each of them.

| Property | Volume | Length | | Mass | Temperature |
|---|---|---|---|---|---|
| Tools | Measuring cup | Tape measure | Ruler | Balance | Thermometer |

**Note**

You may need to measure more than one property of a material to determine if this material is the right one you can use for a certain purpose or not.



### Check your understanding

▸ **Put each of the following tools in front of its suitable sentence :**

**( Measuring cup – Thermometer – Ruler – Balance )**

1. A tool is used to measure the mass of materials. (......................)
2. A tool is used to measure the temperature of materials. (......................)
3. A tool is used to measure the volume of materials. (......................)
4. A tool is used to measure the length of materials. (......................)

In the Assessment Book :
Try to answer :
Self-Assessment (19)

| | | | |
|---|---|---|---|
| odor | رائحة | measuring cup | وعاء قياس |
| certain purpose | غرض معين | texture | ملمس |

# Exercises on Lesson 1

● Understand ○ Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. Homes which are built in a cold weather area have roofs made up of ..........
   a. ceramic tiles. b. strong stones.
   c. carton paper. d. leaves and sticks.

2. Roofs of .......... are made up of strong stones.
   a. desert homes only
   b. cold weather homes only
   c. desert homes and cold weather homes
   d. desert homes and tropical rainforest homes

3. Which of the following homes have an inclined roofs ? .......... *(Gharbia 2023)*
   a. Desert homes only.
   b. Tropical rainforest homes only.
   c. Desert homes and cold weather homes.
   d. Tropical rainforest homes and cold weather homes.

4. We can measure the mass of a cube of ice by using a ..........
   a. thermometer. b. ruler.
   c. measuring cup. d. balance.

5. We can measure .......... of a liquid by using measuring cup. *(Cairo 2023)*
   a. length b. volume
   c. mass d. temperature

6. You can measure the length of your friend by using a ..........
   a. thermometer. b. tape measure.
   c. balance. d. measuring cup.

7. All the following can be used to describe matter, <u>except</u> ..........
   a. shape. b. price.
   c. color. d. texture.

8. We can identify milk by determining its ..........
   a. color and texture. b. shape and odor.
   c. color and size. d. color and taste.

## 2 Choose from column (B) what suits it in column (A) :

| Column (A) | Column (B) |
|---|---|
| 1. Thermometer<br>2. Ruler<br>3. Measuring cup<br>4. Balance | a. is used to determine the length of a book.<br>b. is used to determine the mass of some apples.<br>c. is used to determine the temperature of a hot cup of tea.<br>d. is used to determine the volume of an amount of water.<br>e. is used to determine the shape of a book. |

1. ................ 2. ................ 3. ................ 4. ................

## 3 Put (✓) or (X) :

1. We can describe a solid matter by its color and shape. *(Giza 2023)* (   )
2. The roof of tropical rainforest home is made up of leaves and sticks. (   )
3. The roof of desert home is made up of strong stones to protect it from snow. (   )
4. We can measure the volume of an amount of oil by using tape measure. (   )
5. The length of the classroom wall is measured by using a balance. (   )
6. You can use thermometer to measure the temperature of a hot cup of water. (   ) *(Cairo 2023)*
7. We can differentiate between sugar and salt by using their color. (   )

## 4 Write the scientific term of each of the following :

1. A material that is used to build the roofs of cold weather homes. (....................)
2. A material that is used to build the roofs of desert homes. (....................)
3. The property of matter which is measured by a measuring cup. (....................)
4. The property of matter which is measured by a balance. (....................)
5. The property of matter which is measured by a tape measure. (....................) *(Damietta 2023)*

## 5 Complete the following sentences :

1. We can use different materials to make a roof, depending on the ................ where the home is located.
2. We can differentiate between ice and water as ice is a ................ state while water is a ................ state. *(Cairo 2023)*
3. The ................ of your school bag can be determined by a balance.
4. You can use a ................ to measure the mass of matter, while you can use a ................ to measure its temperature.

5. You can use a ruler to measure the .................. of your book, while you can use a balance to measure its ..................
6. In the Earth's polar zone, people use .................. in building their home roofs to protect them from ..................

## 6 Give reasons for :

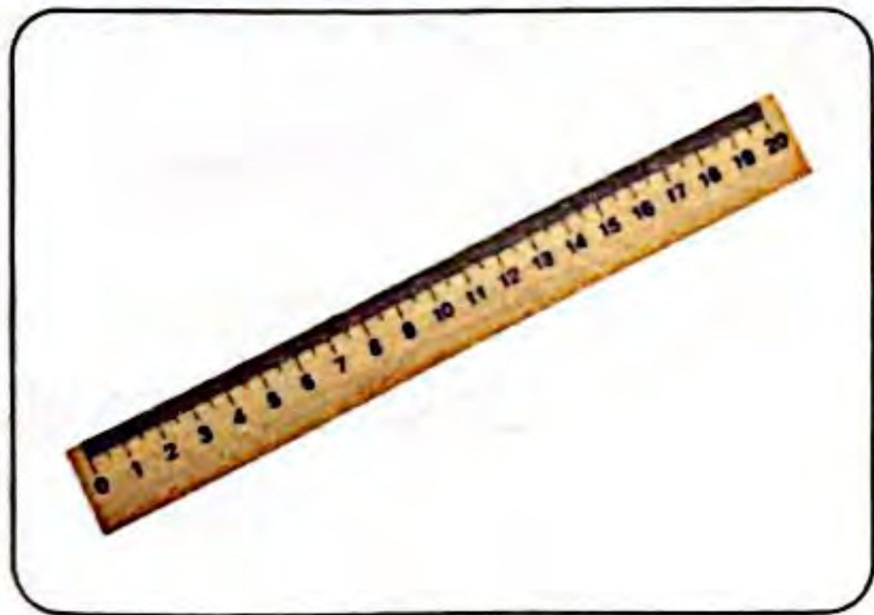
1. The roof of a desert home is made of strong stones.
.......................................................................................................................................................
2. The roof of a tropical rainforest home is made of leaves and sticks.
.......................................................................................................................................................

## 7 What happens if ...?

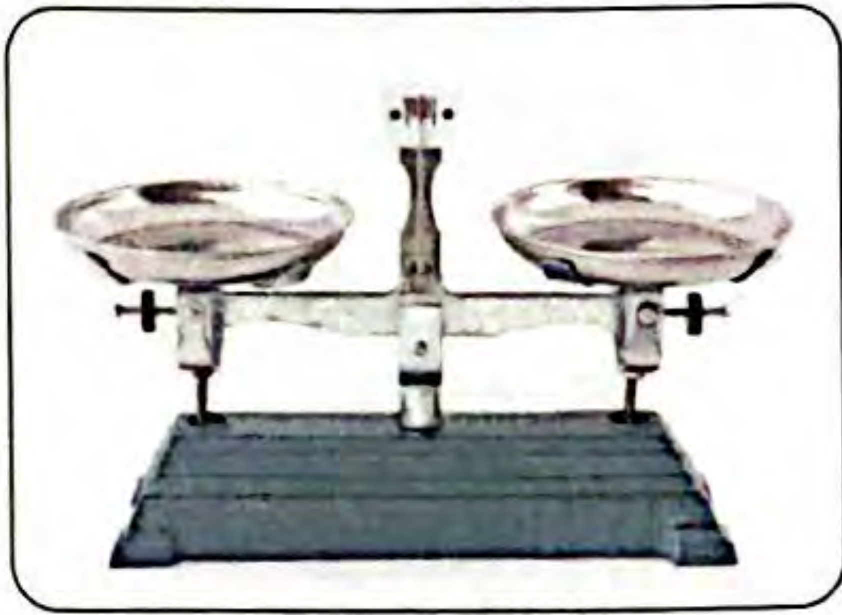
The roofs of cold weather homes are flat.
.......................................................................................................................................................
.......................................................................................................................................................

## 8 Choose the suitable tool to measure some things found at your classroom (you can choose the same tool more than once) :

*(Cairo 2023)*


Tool (A)

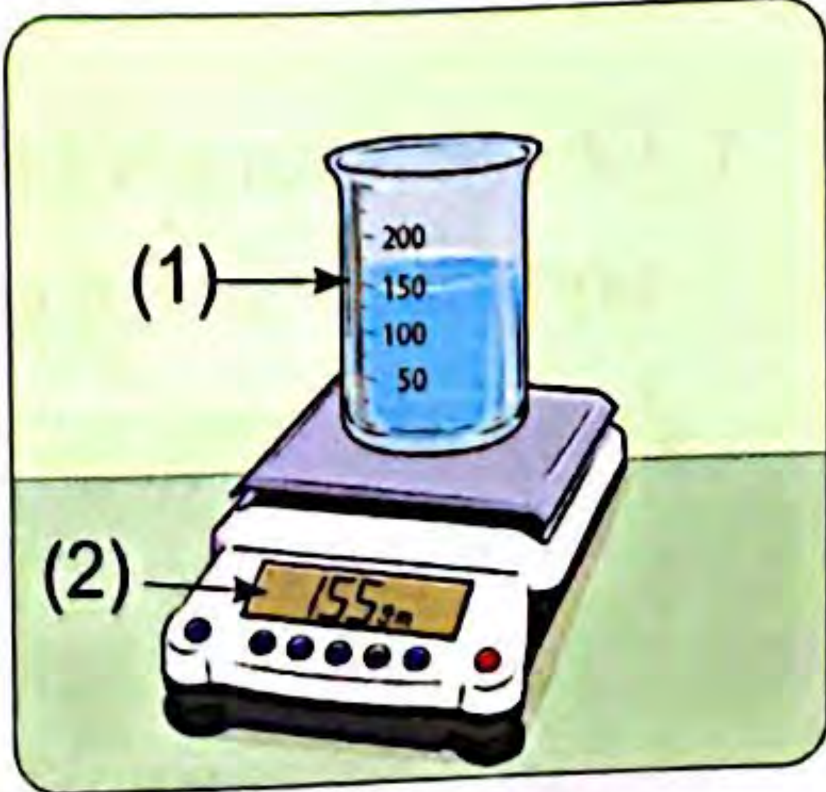

Tool (B)


Tool (C)

1. You can measure the height of your chair by using tool (......................)
2. You can measure the mass of your copybook by using tool (......................)
3. You can measure the volume of the water that is found in your bottle by using tool (......................)
4. You can measure the length of your pencil case by using tool (......................)

## 9 From the opposite figure, tool (1) is used to measure ............... of water, while tool (2) is used to measure ............... of tool (1) and water.

a. mass – length
b. volume – temperature
c. mass – volume
d. volume – mass



# LESSON TWO

## Activity 4 The Case of the kitchen Mystery

▶ **Look at the opposite picture, then put (✓) or (×) :**

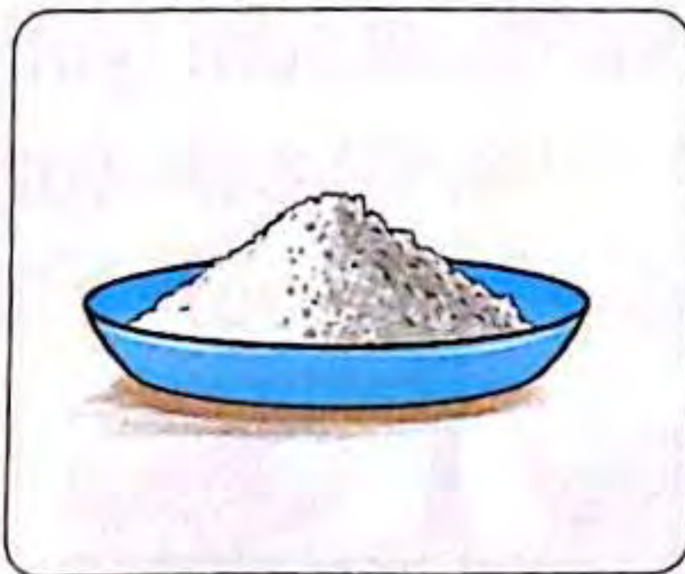


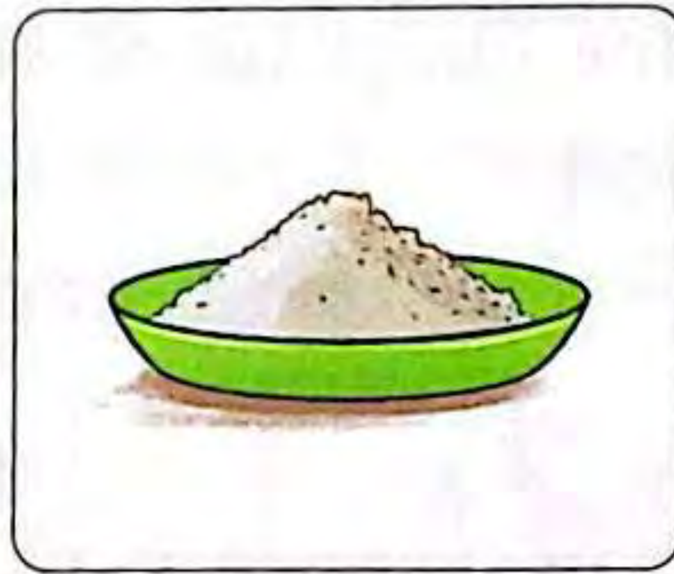
1. All these objects have the same shape. (   )
2. We can use the sense of sight to differentiate between these objects. (   )

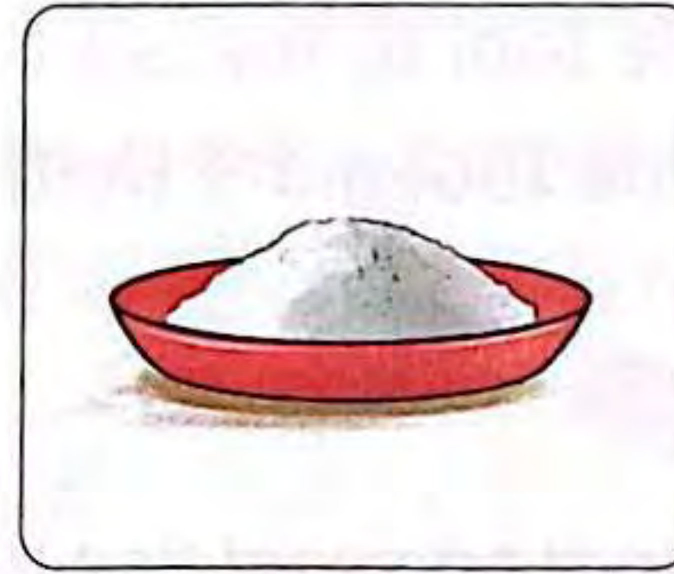
▶ **In this activity, we will examine a variety of substances that look alike.**

- **All substances in this activity are known, but one of them is unknown.**
- **We will use our senses to describe the properties of each substance.**

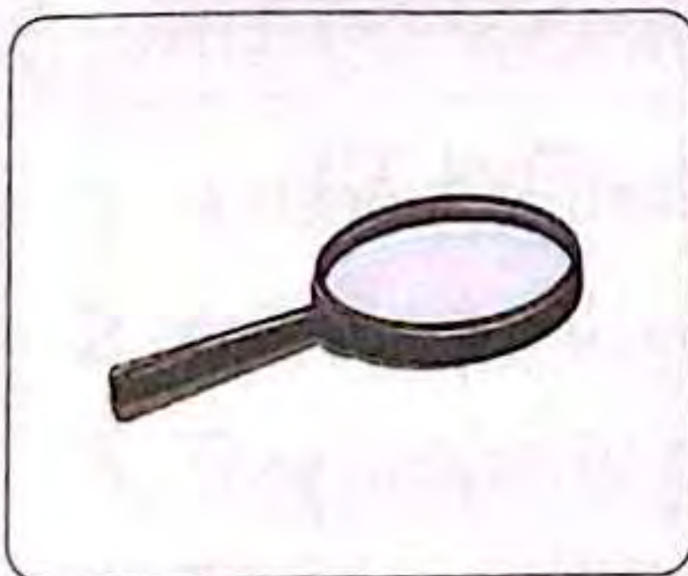
### ▶ Tools


Sugar


Salt


Flour


Unknown mixture


Lens

**Note**

The unknown mixture is a mixture of two substances found in the materials available in this activity.

### ▶ Steps



1. Check (examine) the four plates in front of you and touch all the substances with your hand to feel their textures.

| | | | | | |
|---|---|---|---|---|---|
| mystery | لغز | burning | احتراق | touch | يلمس |
| senses | حواس | variety | تشكيلة | plates | أطباق |
| available | متوفرة / متاحة | | | | |



2. Smell all the substances and know the odor of all of them.



3. Use the lens to observe the shape of crystals of each substance.

## Observations

1. All substances have the same color.
2. The substances have different odors.
3. The substances are made up of :
   - Large crystals as in sugar.
   - Small crystals as in salt.
   - Very fine particles as in flour.
   - A mixture of large crystals and very fine particles as in the unknown mixture.



**Note**

According to the previous observations we can find out that the unknown mixture is a mixture of sugar and flour.

## Conclusion

Color, texture, odor and shape are some of the properties of matter that are called physical properties.



## Check your understanding

### Complete the following sentences :

1. Color and texture are from the .................. properties of matter.
2. You can use your sense of .................. to know the odor of the different matter.

**In the Assessment Book :**
Try to answer :
Self-Assessment (20)

| | | | | | |
|---|---|---|---|---|---|
| large | كبير | fine | ناعم / دقيق | crystals | بلورات |
| physical properties | الخصائص الفيزيائية | particles | حبيبات | | |

# Exercises on Lesson 2

● Understand ○ Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. ........... has large sized crystals, while ........... has small sized crystals.
   a. Salt – sugar b. Salt – flour c. Sugar – flour d. Sugar – salt
2. Which of the following properties is/are considered as physical properties of matter ? ........... *(Ismailia 2023)*
   a. Color only. b. Shape only.
   c. Color and odor only. d. Color, shape and odor.
3. We can differentiate between vinegar and perfume by using the sense of ...........
   a. touch. b. sight. c. smell. d. hearing.
4. We can differentiate between salt and flour through all the following properties, except the ...........
   a. shape of particles. b. texture of particles.
   c. taste. d. color.
5. We can differentiate between all the following matter as they have different colors, except ...........
   a. salt and flour. b. salt and pepper.
   c. milk and oil. d. flour and pepper.

## 2 Put (✓) or (✗) :

1. Salt and sugar have the same color and odor. ( )
2. You can use the lens to identify the odor of sugar. ( )
3. Among physical properties of matter are shape and texture. *(Beni Suef 2023)* ( )
4. We can differentiate between sugar and flour by texture only. ( )
5. Color of milk is considered as one of its physical properties. ( )
6. You can differentiate between the components of salt and flour mixture by using your sight sense only. *(Cairo 2023)* ( )

## 3 Complete the following sentences by using the words below :

**(odor – smaller – physical – color)**

1. The taste of apple is from .................. properties of apple. *(Giza 2023)*
2. Salt and sugar are similar in ..................

3. You can identify the .................. of a juice by using the sense of smell.
4. The crystals of salt is .................. than that of sugar.

## 4 Give a reason for the following :

You can use the sense of sight only to differentiate between salt and pepper.

..........................................................................................................

..........................................................................................................

## 5 Identify the components of the following mixture, using the table below that shows some properties of three different substance :

1. A mixture of large crystals substance and large particles substance :

..........................................................................................................

2. A mixture of sweet taste substance and salty taste substance :

..........................................................................................................

3. A mixture of small crystals substance and black color substance :

..........................................................................................................

| Substances | Sugar | Salt | Pepper |
|---|---|---|---|
| Properties | - Sweet taste.<br>- Large crystals.<br>- White color. | - Salty taste.<br>- Small crystals.<br>- White color. | - Spicy taste.<br>- Large particles.<br>- Black color. |

# LESSON THREE

## Activity 5 Properties of Matter

▶ **Look at the following picture, then put (✓) or (×) in front of the following sentences :**



1. The material of the paper is changed after its burning. ( )
2. Can you use the ash that is produced from the burned paper to form a new paper again. ( )

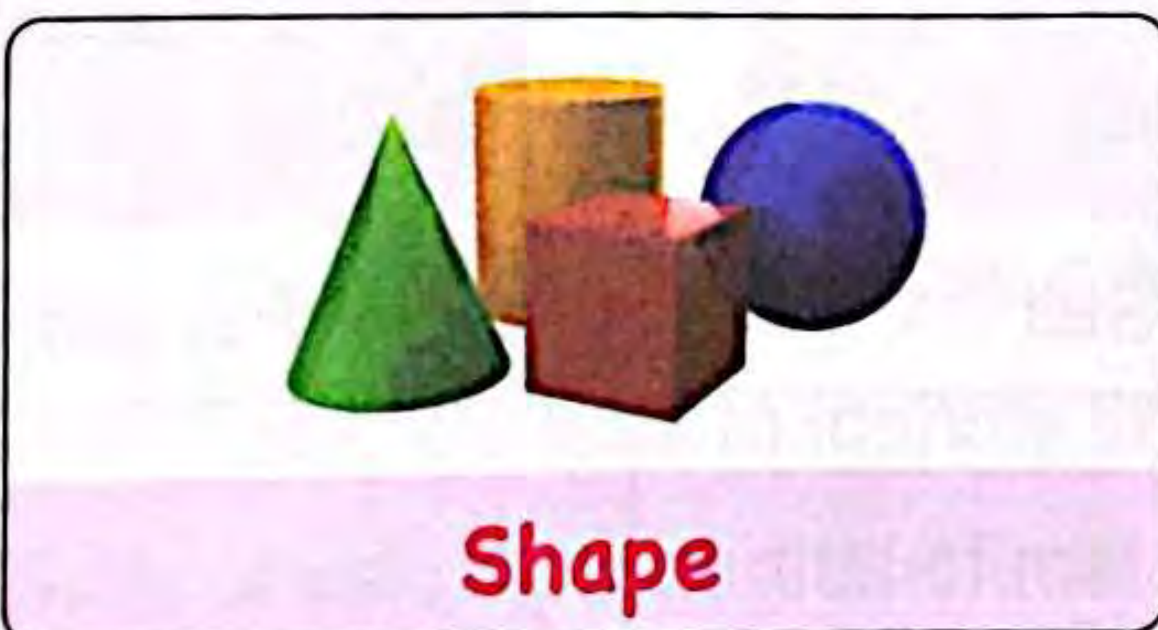
- You have learned different ways to describe and measure matter.
- Now we will learn more ways in which matter can be observed and measured.

### FIRST Physical properties

- Physical properties of matter are :


Color


Odor


Shape


Texture

**Notes**

1. You can observe the physical properties with your five senses.
2. You can use words such as rough, blue, round and sweet to describe the physical properties.

### SECOND Chemical properties

Chemical properties of a material can be observed and measured by the changes that happen in this material when it interacts with other materials.

| | | | | | |
|---|---|---|---|---|---|
| observe | ملاحظة | rough | خشن | sweet | حلو |

## Examples of chemical properties



▸ **The ability to burn :**

Such as when a paper interacts with fire, the paper becomes ash.

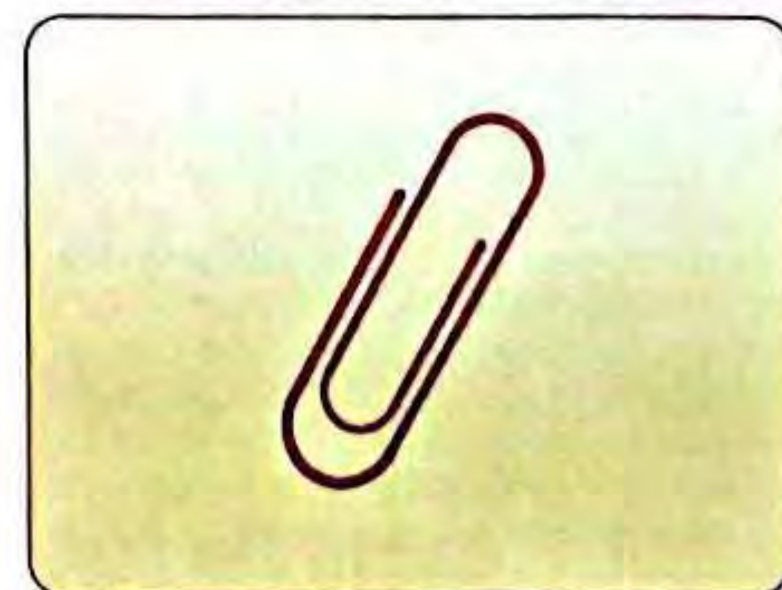


▸ **The ability to rust :**

Such as when an iron nail interacts with water and air, the iron nail rusts.

## Volume and Mass

**Now,** let's study volume and mass that are considered important properties of matter.

| Volume | Mass |
|---|---|
| It is the amount of space that matter takes up. | It is a measure of the amount of matter. |
| The measuring units of volume are :<br>- Liters (L).<br>- Milliliters (mL).<br>- Cubic centimeters ($cm^3$). | The measuring units of mass are :<br>- Gram (g).<br>- Kilogram (Kg). |
| 1L = 1000 mL = 1000 $cm^3$ | 1 Kg = 1000 g |
| Example : A big bottle of water contains 1 liter or more.<br> | Example : A paperclip has a mass about 1 gram.<br> |

**Note**

One liter of water has a mass of 1 kilogram.




| | | | | | |
|---|---|---|---|---|---|
| iron nail | مسمار | chemical properties | الخواص الكيميائية | interact | يتفاعل |
| ash | رماد | rust | صدأ | | |

## Temperature

- In the previous concept you have learned that matter is made up of particles that are in continuous motion.
- Temperature is a measure of how quickly the particles in a matter are moving.



**Notes**

1. Quickly moving particles produce more heat energy than slower moving particles.
2. Volume, mass and temperature are properties of matter that you can measure.



## Check your understanding

▶ **Put (✓) or (✗) :**

1. The ability of matter to burn and rust are considered from chemical properties of matter. ( )
2. The measuring units of volume are liters, milliliters and cubic centimeters. ( )
3. Quickly moving particles produce less heat energy than slower moving particles. ( )



motion حركة | produce ينتج

# Activity 6 Measuring Properties

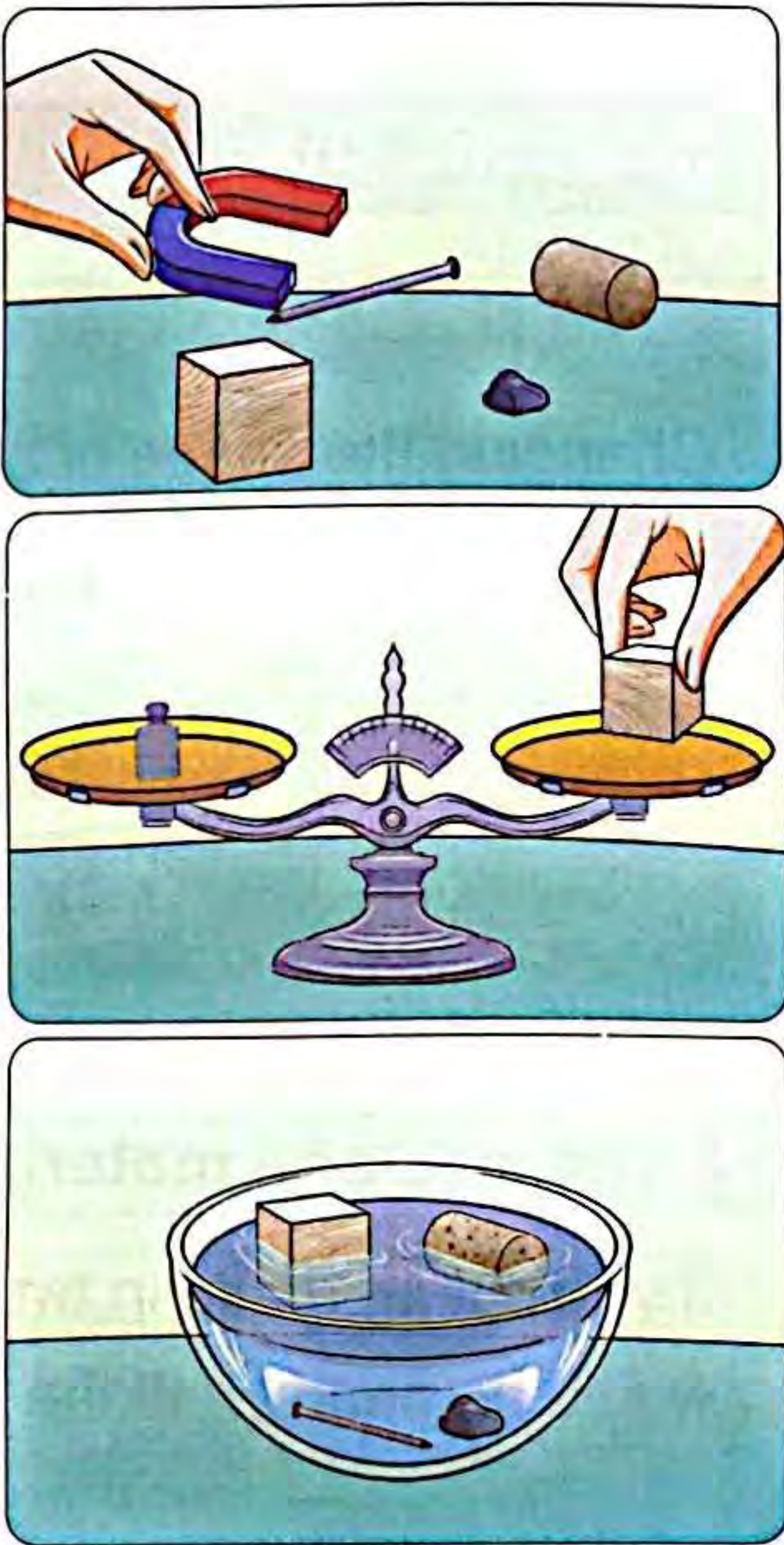
- You have learned the properties of matter and how to describe and measure it.

**In this activity we will measure different physical properties of matter.**

## Tools

Basin containing water – Magnet – Balance – Stone
Iron nail – Piece of wood – Piece of cork

## Steps



1. Hold the magnet near to each of the previous substances, and observe what substances are attracted to the magnet.
2. Measure the mass of each substance by using the balance.
3. Put all substances in the basin that contains water to observe which materials will float and which will sink.
4. Record your results in the following table.

## Observations

| Property \ Substance | Stone | Iron nail | Piece of wood | Piece of cork |
|---|---|---|---|---|
| Attracted to magnet or not | Not attracted | Attracted | Not attracted | Not attracted |
| Mass (g) | 50 | 30 | 100 | 20 |
| Sink or float | Sinks | Sinks | Floats | Floats |

## Conclusions

- Some substances are attracted to the magnet and some other substances are not attracted to the magnet.
- Floating and sinking of a substance doesn't depend on its mass.

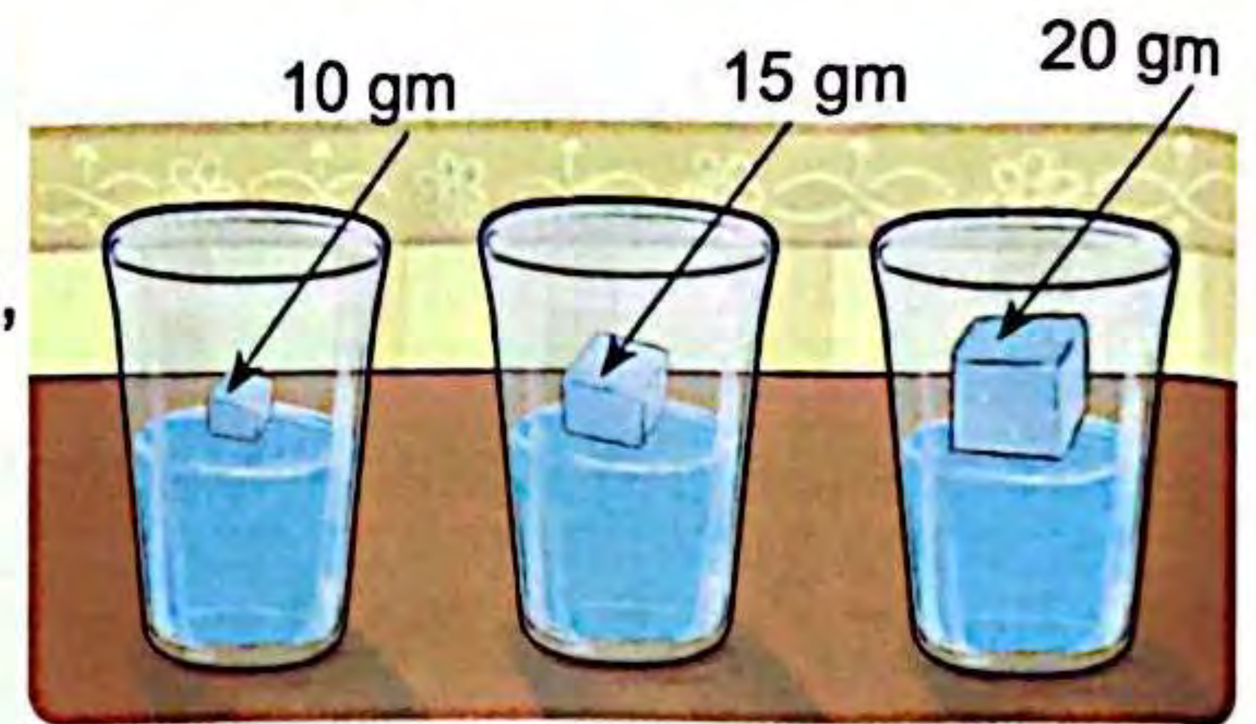
| | | | |
|---|---|---|---|
| attract ينجذب | basin حوض | cork فلين | hold يمسك |

**Note**

Ice is lighter than water so, ice floats on the water surface.

Example :

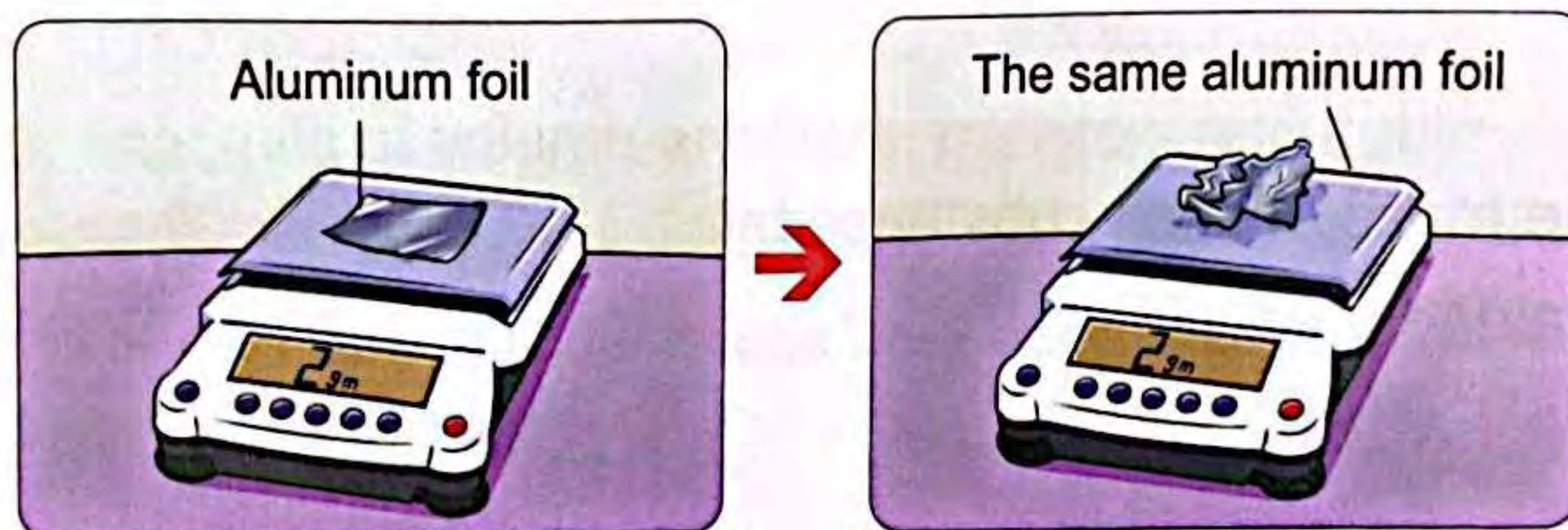
The opposite figures show three ice cubes with different masses (10 gm - 15 gm - 20 gm), all ice cubes float on the surface of water because ice is lighter than water.




## Does the shape and size affect the mass of a material ?

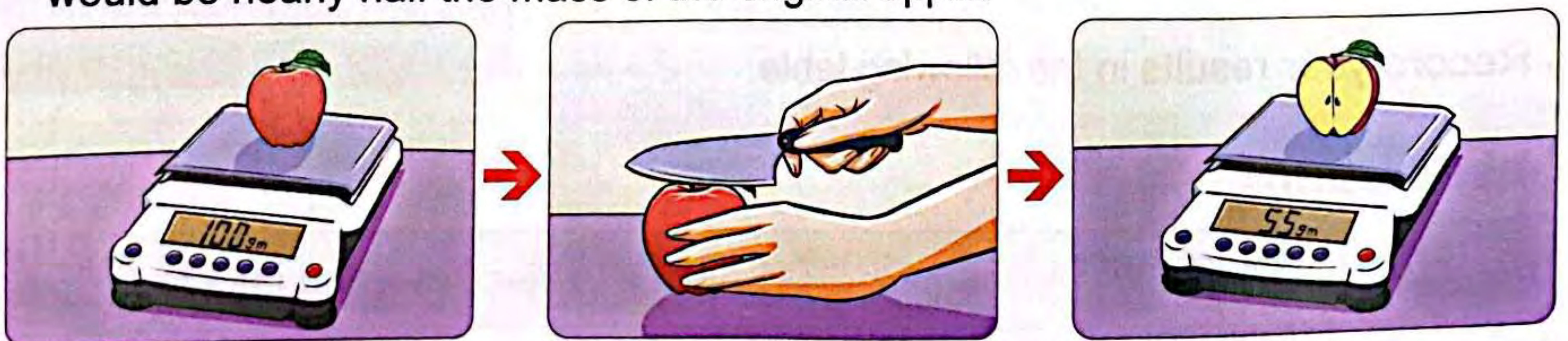
### 1 The shape of a material

Changing the shape of a material doesn't affect its mass.




### 2 The size of a material

If you cut an apple in two halves and measure the mass of one half, the mass would be nearly half the mass of the original apple.





**Check your understanding**

▶ Put (✓) or (×) :

1. All substances are attracted to the magnet. ( )
2. Changing the shape of a material doesn't affect its mass. ( )
3. Floating and sinking of a substance doesn't depend on its mass. ( )



float يطفو sink يغوص

## Activity 7 Measuring Matter

- You have learned a lot about using measurements to compare materials and properties of matter.
- **In this activity you will apply what you have learned about measuring matter.**
  - In front of you three materials, observe the data of each of them to compare between their properties.

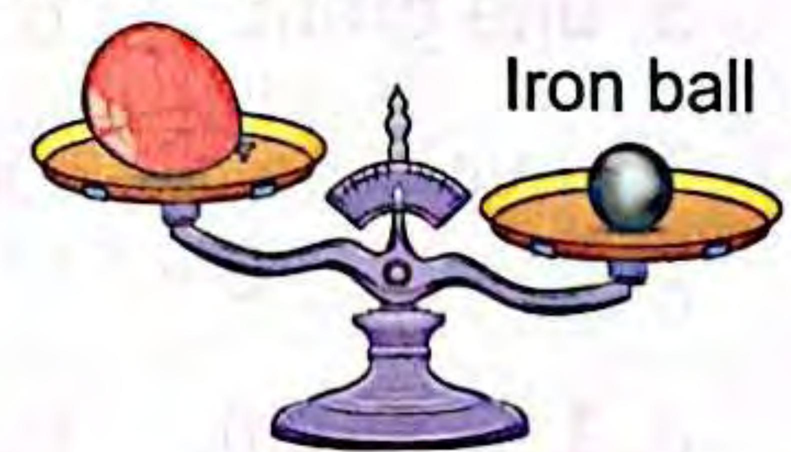



- **Based on the previous data we can conclude that :**
  - Material (1) has the biggest mass although it doesn't have the largest volume.
  - Material (2) has the largest volume although it doesn't have the biggest mass.
  - Material (2) is the longest one.



**Note**

**For example :**
Although an inflatted balloon takes larger volume than that of an iron ball, it has bigger mass than that of the inflatted balloon, this is due to that the iron ball contains more amount of matter than the balloon.






### Check your understanding

- **Put (✓) or (✗) :**

1. All materials which have big masses must have large volume. (   )
2. If two different materials have the same volume, so they must have the same mass. (   )

**In the Assessment Book :**
**Try to answer :**
Self-Assessment (21)

# Exercises on Lesson 3

Understand    Apply    Higher Thinking Skills

## 1 Choose the correct answer :

1. When the iron interacts with water and air, it ..........
   a. becomes ash.    b. becomes powder.
   c. burns.    d. rusts.
2. The ability of wood to burn is considered as .......... of wood.
   a. only physical property
   b. only chemical property
   c. both physical and chemical properties
   d. neither physical nor chemical properties
3. The physical property of milk through which you can see it, is the .......... of it.
   a. odor    b. texture    c. color    d. taste    *(Gharbia 2023)*
4. All the following are physical properties of matter, except ..........    *(Ismailia 2023)*
   a. color.    b. rusting.    c. texture.    d. shape.
5. We can measure the volume of a liquid in all the following units, except ..........
   a. kilogram.    b. milliliters.
   c. cubic centimeters.    d. liters.
6. The volume of one liter of water has a mass of ..........
   a. one gram.    b. one kilogram.    c. one milliliter.    d. one cubic centimeter.
7. The volume of 1000 cubic centimeters of a liquid is equal to the same volume of ..........
   a. 1 kilogram.    b. 1 gram.    c. 1 centimeter.    d. 1 liter.
8. When particles of matter move quickly they produce more .......... energy.
   a. thermal    b. light    c. sound    d. solar
9. All the following properties of matter can be measured by different tools, except ..........
   a. mass.    b. volume.    c. color.    d. temperature.
10. Which of the following objects is attracted to the magnet ? ..........
    a. Ice cube.    b. Paper clip.    c. Woody spoon.    d. Plastic ruler.
11. Which of the following objects floats on the surface of water ? ..........
    a. Iron spoon.    b. Piece of stone.    c. Iron nail.    d. Piece of cork.

12. Which of the following objects sinks and not attracts to the magnet ? ..........
   a. Wood cube.
   b. Iron nail.
   c. A piece stone.
   d. Plastic cup.

13. If you fold a piece of paper, its .......... will not change.
   a. mass and color
   b. color and shape
   c. mass and shape
   d. color and size

14. If we cut a tomato into two halfs, the .......... of one half of tomato will decrease to its half.
   a. color
   b. mass
   c. temperature
   d. shape

15. One kilogram of tomato differs from one kilogram of wood in the ..........
   a. volume only.
   b. mass only.
   c. volume and mass.
   d. color and mass.

## 2 Put (✓) or (X) :

1. Shape is one of chemical properties of matter. (   )
2. All physical properties of matter can be measured. (   )
3. If the masses of two different materials are equal, so their volume must be equal. *(Dakahlia 2023)* (   )
4. Ability of fuel to burn is considered from chemical properties of fuel. (   )
5. When we put an iron nail in water and then leave it in air, it will rust. (   )
6. The temperature increases by increasing the speed of moving particles of a matter. (   )
7. Iron spoon is attracted to the magnet. *(Damietta 2023)* (   )
8. Iron nail is attracted to the magnet and floats on the surface of water. (   )
9. If we put a wooden cube in water, it will float. (   )
10. If we cut an apple into 4 pieces, the mass of each piece is less than the mass of whole apple. (   )
11. 1 kilogram of water has a volume equals 1000 milliliters. (   )
12. The mass of iron bar whose volume equals 50 $cm^3$ differs from the mass of wood bar that has the same volume. *(Cairo 2023)* (   )

## 3 Write the scientific term of each of the following :

1. The properties of matter which you can observe by using your five senses. (....................)
2. The properties of matter which can be observed and measured by the changes that happen when the material interacts with other materials. (....................)
3. It is the amount of space that matter takes up. *(Cairo 2023)* (....................)
4. It is a measure of the amount of matter. (....................)
5. It is a measure of how quickly the particles in a matter are moving. (....................)

## 4 Complete the following sentences by using the words below :

**(one thousand – chemical – temperature – volume – physical – rough – mass – iron – attracted – doesn't attract – cotton – floats – sinks)**

1. Both of odor and texture of matter are considered from the .................. properties of matter.
2. The ability of a piece of iron to rust is from the .................. properties of matter.
3. By decreasing the speed of particles of a matter its .................. will decrease.
4. We can describe the texture of sugar crystals by saying "it has .................. crystal texture".
5. A spoon of wood .................. to the magnet and .................. on the surface of water. *(Minia 2023)*
6. An iron ruler .................. in water, and .................. to the magnet.
7. The .................. of 1 liter of water has a mass of 1 kilogram.
8. The mass of 1 kilogram of apple equals the mass of .................. pieces of paper clip.
9. If you eat a small piece from a banana, so the .................. of the remaining piece of banana will decrease.
10. If an iron cube and an amount of cotton have the same mass, so the volume of .................. is smaller than that of the ..................

## 5 Give reasons for :

(Cairo 2023)

1. Rusting of iron is considered a chemical property of matter.

.............................................................................................................

.............................................................................................................

2. When the particles of a matter move quickly, its temperature increases.

.............................................................................................................

.............................................................................................................

## 6 What happens to ...?

1. A piece of paper if it interacts with fire.

.............................................................................................................

.............................................................................................................

2. The temperature of a matter if the speed of its particles decreases.

.............................................................................................................

.............................................................................................................

3. An iron nail and a plastic spoon if they are put close to a magnet.

.............................................................................................................

.............................................................................................................

4. A piece of cork if it is put in water.

.............................................................................................................

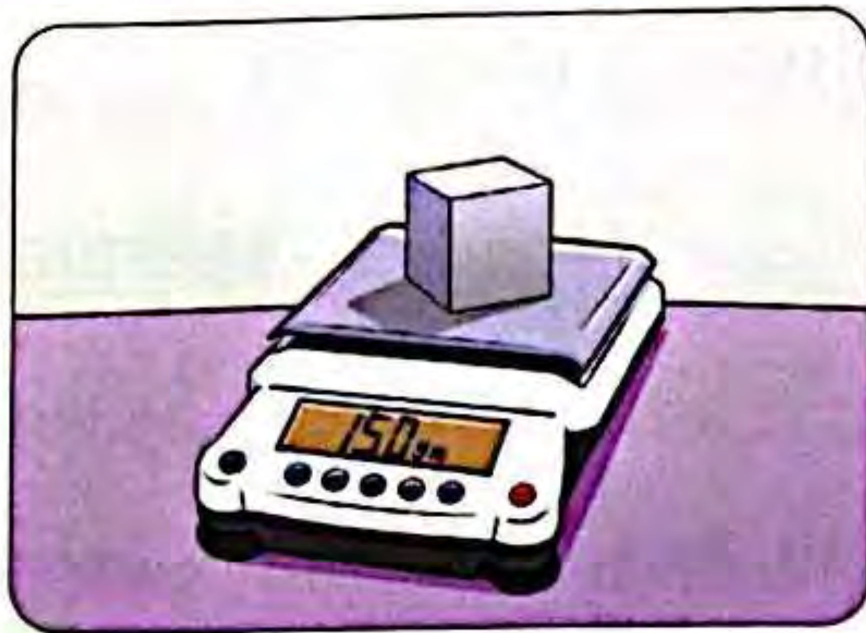
.............................................................................................................

## 7 Put letter (P) in front of physical properties and letter (C) in front of chemical properties of the different materials below :

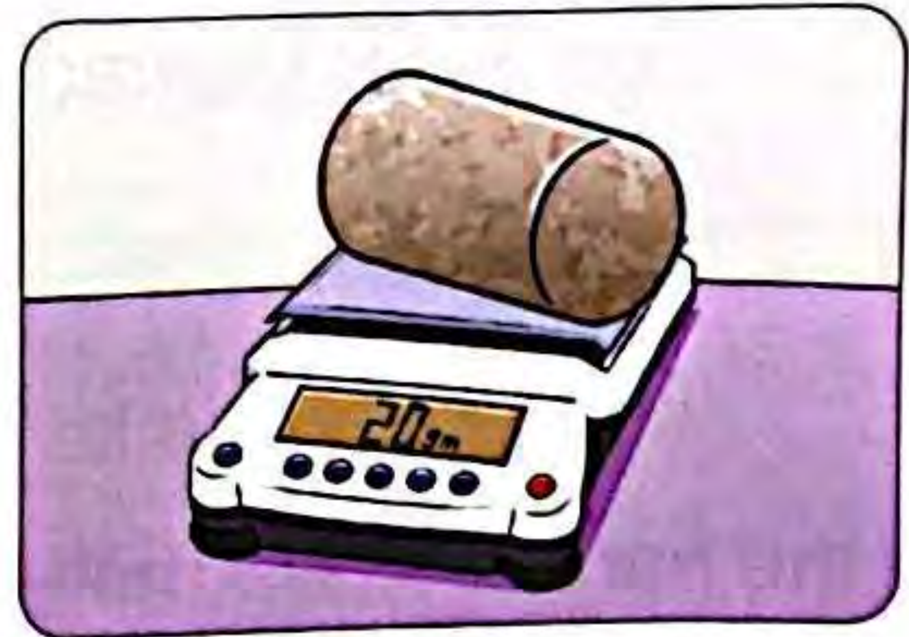
(Giza 2023)

1. The white color of milk. (..................)
2. The ash produced from burning a paper. (..................)
3. The large crystals of salt particles. (..................)
4. The odor of perfume. (..................)
5. The rusting of a piece of iron. (..................)
6. The sweet taste of sugar. (..................)
7. The round shape of a ball. (..................)

**8 Look at the following figures, then choose the correct answer :**



Material (A) Iron cube



Material (B) Piece of cork

1. Material .................. has the largest volume.
(A – B)

2. Material .................. has the largest mass.
(A – B)

3. Material .................. is attracted to the magnet.
(A – B)

4. Material .................. floats on the surface of water.
(A – B)

# LESSON FOUR

## Activity 8 Useful Properties of Matter

▶ **Look at the opposite picture, then put (✓) or (✗) :**



1. This cooking pan is made up of copper. ( )
2. Handles of this cooking pan are made up of plastic. ( )

▶ **In this activity, we will learn about the useful properties of some materials.**

### Helium

**Properties of helium**

**Physical properties**

It is a light gas which means it is lighter than air.

**Chemical properties**

- It is not poisonous.
- It is not flammable (A flammable material means that this material burns and form fire).

**Uses of helium**

**It is used to fill balloons**



**It is used to fill blimps**




**Give reason for :**

**Balloons and blimps filled with helium always rise up in the air.**
Because the helium is lighter than air.

**Note**

As helium is not flammable or poisonous, so it is a gas that can be used safely.

| | | | | | |
|---|---|---|---|---|---|
| cooking pan | مقلاه | light gas | غاز خفيف | flammable | قابل للاشتعال |
| useful | مفيد | poisonous | سام | blimps | مناطيد |

## Copper

### Physical properties

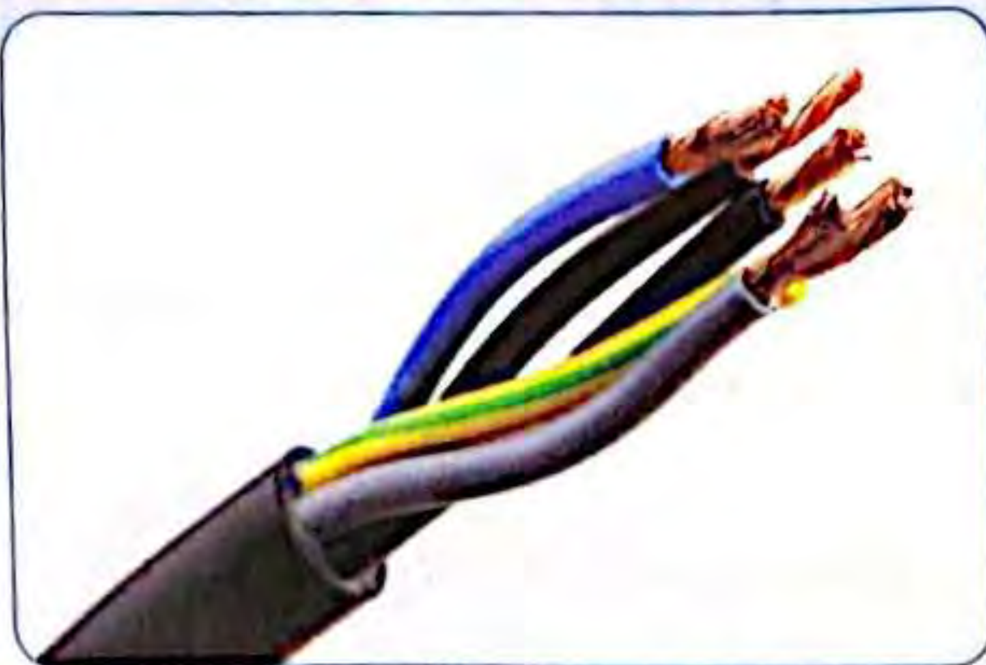
- It can be shaped into thin, flexible wires.
- It conducts electricity well (good conductor of electricity).
- It conducts heat well (good conductor of heat).

**Conduction :**

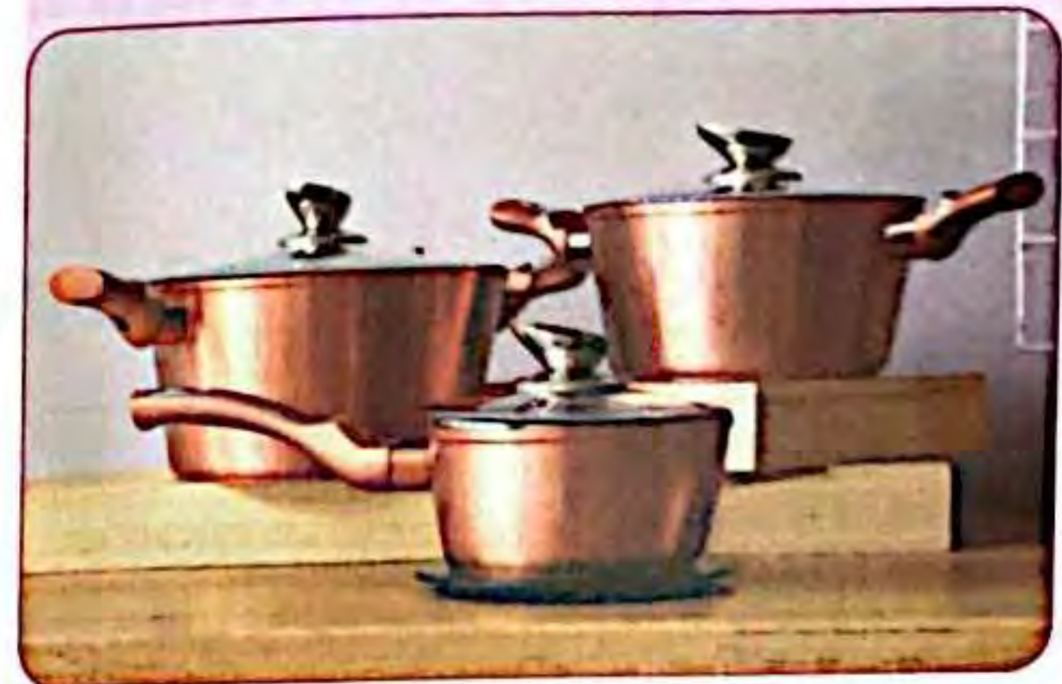
The ability of materials to transfer heat and conduct electricity.

### Uses of copper

It is used in making electrical wires



It is used in making cooking pans





**Give reason for :**

**Electric wires are made up of copper.**

Because copper is a good conductor of electricity and can be stretched into a thin, flexible wire.

**Note**

Wood and plastic are bad conductors of heat so, they can be used in making handles of cooking pans.

## Check your understanding

▸ Look at the following figures, then answer the questions :

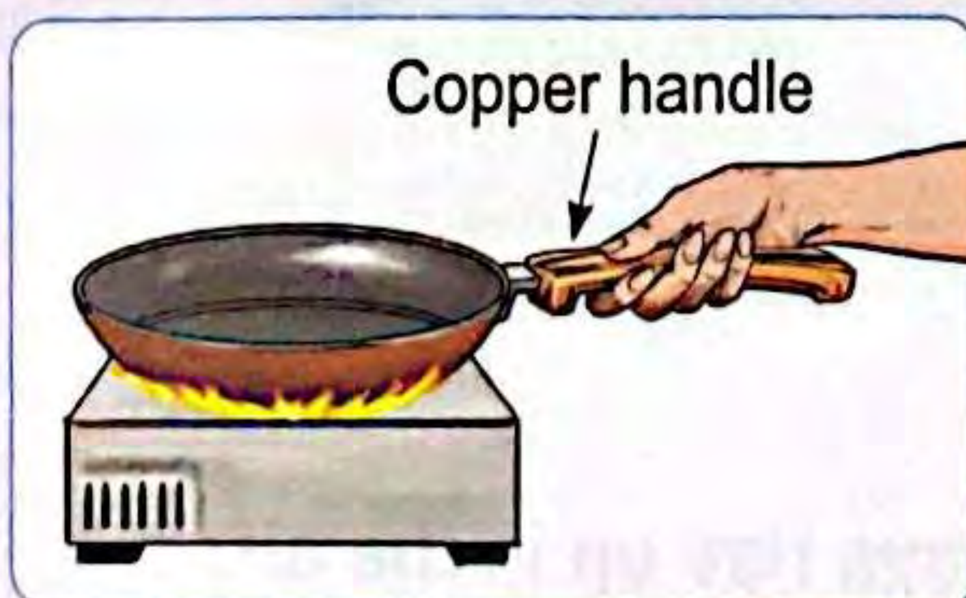



Figure ⓐ

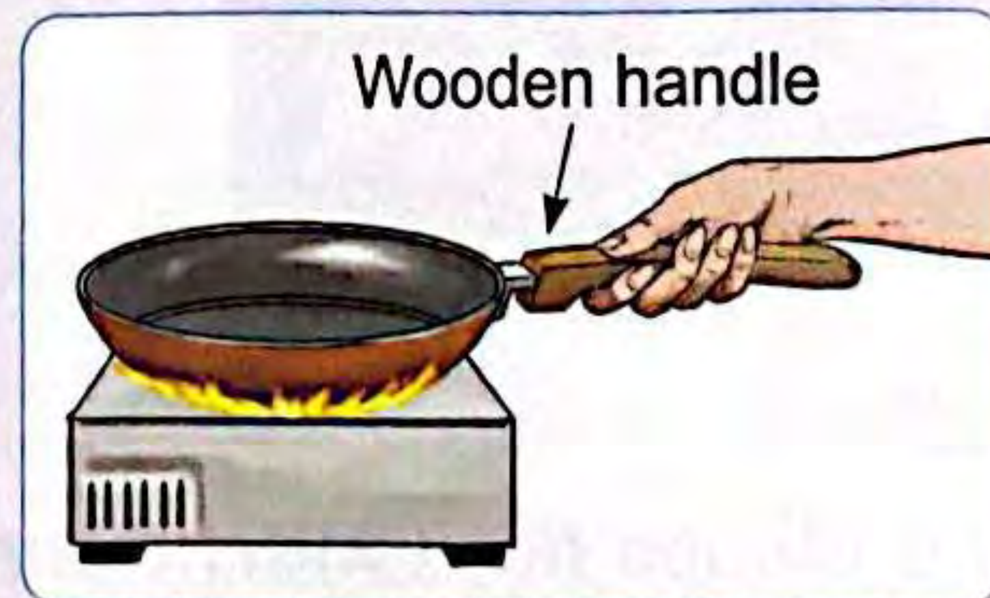



Figure ⓑ

1. In which figure the hand will feel hot. (Figure ⓐ – Figure ⓑ)
2. The cooking pan is made up of ........................ (wood – copper)

| | | | | | |
|---|---|---|---|---|---|
| copper | نحاس | thin | رفيع | conduction | توصيل |
| electrical wires | أسلاك كهربية | flexible | مرن | transfer | نقل |
| shaped | يشكل | | | | |

## Activity 9 Uses of Matter

- **You have learned a lot about the properties of materials.**

**Now,** we will learn about some uses of some other materials.

- **The following table shows some uses of some materials and their properties.**

| Types of matter | Uses (purposes) | Property |
|---|---|---|
| Steel | Screwdrivers, Hammers | • Hard.<br>• Strong. |
| Glass | Windows, Light bulb, Eyeglasses | • Transparent.<br>• Smooth. |
| Rubber | Tires, Gloves, Athletic shoes | • Waterproof.<br>• Flexible. |



### Check your understanding

- **Complete the following sentences :**

1. Among the properties of rubber that it is waterproof and ......................
2. Hammers are made up of ......................

| | | | | | |
|---|---|---|---|---|---|
| steel | صُلب | athletic shoes | أحذية رياضية | tires | إطارات |
| hammers | مطارق | screwdrivers | مفكات | rubber | المطاط |
| waterproof | مضاد للماء | | | | |

## Activity 10 Record Evidence Like A Scientist

- In this concept, you have learned a lot about matter and how describing and measuring it.
- **Now,** try to think like a scientist by writing your claim, your evidence and your scientific explanation about one of the main points of this concept through the four steps you have learned in the previous concepts.

### Step 1 The Question

How is matter described and measured ?

### Step 2 My Claim

.....................................................................................................................................

.....................................................................................................................................

.....................................................................................................................................

### Step 3 My Evidence

.....................................................................................................................................

.....................................................................................................................................

.....................................................................................................................................

.....................................................................................................................................

### Step 4 My Scientific Explanation

.....................................................................................................................................

.....................................................................................................................................

.....................................................................................................................................

.....................................................................................................................................

.....................................................................................................................................

### Review on Concept [ 2 - 2 ]

To review this concept look at the **Assessment Book** "Part 2 : Final Revision".

**In the Assessment Book :**

**Try to answer :**

- Self-Assessment (22)
- Model Exam on Concepts (2.1 & 2.2)

# Exercises on Lesson 4

● Understand ● Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. Helium is lighter than air, this property is considered as ..........
   a. a physical property only.
   b. a chemical property only.
   c. both physical and chemical property.
   d. neither physical nor chemical property.

2. Blimps are filled with .......... to rise up in the air.
   a. oxygen gas  b. carbon dioxide gas
   c. atmospheric air  d. helium gas

3. We can use copper to make .......... *(Cairo 2023)*
   a. handles of cooking pans.  b. body of cooking pans.
   c. gloves.  d. tires.

4. Steel is used in making hammers, because it is .......... *(Giza 2023)*
   a. flexible.  b. smooth.  c. hard.  d. transparent.

5. Glass is transparent, so it can be used in making .......... *(Minia 2023)*
   a. eyeglasses.  b. tires.  c. screwdrivers.  d. gloves.

6. When you put a lighting match close to helium gas, it will ..........
   a. burn.  b. not burn.  c. form fire.  d. freeze.

7. If you touch the end of the copper bar shown in the figure, you will feel it hot because copper is a..........
   a. good conductor of electricity.
   b. bad conductor of electricity.
   c. good conductor of heat.
   d. bad conductor of heat.




8. All the following are from the physical properties of copper, except that ..........
   a. it is good conductor of electricity.
   b. it is good conductor of heat.
   c. it can be stretched into thin wires.
   d. it is lighter than air.

9. Rubber is used to make all the following, except ..........
   a. athletic shoes.  b. gloves.
   c. tires.  d. windows.

## 2 Choose from column (A) what suits it in both columns (B) and (C) :

| (A) Matter | (B) It is used to .......... | (C) Because it is .......... |
|---|---|---|
| 1. Copper | a. make eyeglasses. | A. strong. |
| 2. Helium | b. make tires. | B. good conductor of electricity. |
| 3. Rubber | c. make hammers. | C. transparent. |
| 4. Glass | d. fill balloons. | D. lighter than air. |
| 5. Steel | e. make electrical wires. | E. flexible. |

1. .......... ⟶ ............ 2. .......... ⟶ ............ 3. .......... ⟶ ............
4. .......... ⟶ ............ 5. .......... ⟶ ............

## 3 Put (✓) or (✗) :

1. From the chemical properties of helium is that it is not flammable. ( )
2. Helium is a gas that can be used safely, because it is poisonous. ( )
3. Copper is used in making cooking pans because copper is a good conductor of electricity. ( )
4. Handles of cooking pans are made of wood or plastic because they are bad conductors of heat. *(Gharbia 2023)* ( )
5. Glass is used in making windows, because glass is a transparent material. ( )
6. Rubber is very hard, so it is used in making athletic shoes. ( )
7. Hammers must be very strong, so they are made of steel. ( )
8. When a balloon is filled with helium, it will fall down on the ground. ( )

## 4 Write the scientific term of each of the following :

1. The ability of materials to transfer heat and conduct electricity. (......................)
2. It is a light gas which is used in filling balloons and blimps. (......................) *(Ismailia 2023)*
3. A matter which is used in making gloves because it is waterproof and flexible. (......................)

## 5 Complete the following sentences :

1. Helium is not flammable, this property is considered as a .................. property.
2. We can use .................. gas to fill blimps, because it is lighter than .................. *(Cairo 2023)*
3. Helium is not .................. or .................., so it is considered as a safe gas.
4. The ability of copper to be stretched, is from .................. properties of copper.
5. Cooking pans can be made of copper because it is a good conductor of .................., while electrical wires can be made of copper because it is a good conductor of .................. *(Alex. 2023)*

6. We can use .................. in making hammers because it is .................. and ..................
7. As .................. is a waterproof material, we can use it in making gloves.
8. Glass is used in making windows and eyeglasses, because glass is .................. and ..................
9. The body of cooking pans can be made of .................. , while its handles is made of .................. or plastic. *(Cairo 2023)*

## 6 Give reasons for :

1. Helium is used to fill balloons and blimps.

..........................................................................................

2. Human can use helium gas safely.

..........................................................................................

3. Wood and plastic are used in making handles of cooking pans.

..........................................................................................

## 7 What happens if ... ?

1. A blimp is filled with helium gas. *(Assuit 2023)*

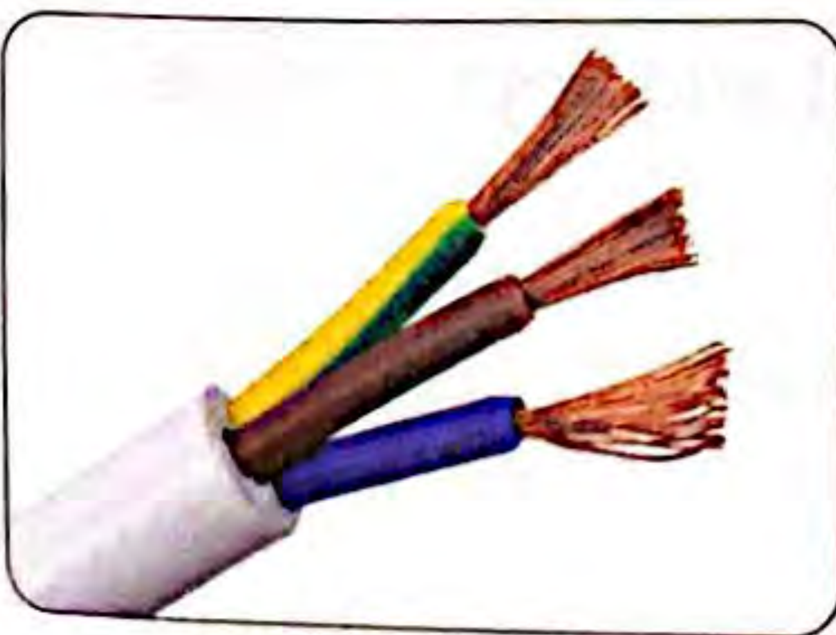
..........................................................................................

2. Electrical wire is made from wood instead of copper.

..........................................................................................

## 8 Look at the following figures, then choose the suitable material which is used in making this objects using the words below :

**(Rubber – Copper – Glass – Helium – Steel)**



1. ........................



2. ........................



3. ........................



4. ........................



5. ........................

# Model Exam 1

## on Concept (2.2)

Total mark
15

**1** **(A) Choose the correct answer :** *(5 marks)*

1. All the following are physical properties of matter, except ..........
   a. color. b. rusting. c. texture. d. shape.

2. Homes which are built in a cold weather area have roofs made up of ..........
   a. ceramic tiles. b. strong stones.
   c. carton paper. d. leaves and sticks.

3. We can differentiate between vinegar and perfume by using the sense of..........
   a. touch. b. sight.
   c. smell. d. hearing.

4. If we fold a piece of foil paper, its .......... will change.
   a. size and shape b. mass and color
   c. mass and shape d. size and mass

**(B) Give a reason for the following :**

Human can use helium gas safely.

..........................................................................................................................................

**2** **(A) Put (✓) or (X) :** *(5 marks)*

1. Rubber is very hard, so it is used in making athletic shoes. ( )
2. 1 kilogram of water has a volume equals 1000 milliliters. ( )
3. You can differentiate between the components of salt and flour mixture by using your sense of sight only. ( )
4. You can use thermometer to measure the temperature of a hot cup of tea. ( )

**(B) What happens if ...?**

A magnet is put close to an iron nail and a plastic spoon.

..........................................................................................................................................

**3 (A) Choose from column (B) what suits it in column (A) :** *(5 marks)*

| (A) | (B) |
|---|---|
| 1. Thermometer | a. is used to determine the length of a book. |
| 2. Ruler | b. is used to determine the mass of some apples. |
| 3. Measuring cup | c. is used to determine the temperature of some ice cubes. |
| 4. Balance | d. is used to determine the volume of an amount of water. |
| | e. is used to determine the shape of a book. |

1. ........................ 2. ........................ 3. ........................ 4. ........................

**(B) Look at the following figures, then write the suitable material which is used in making these tools :**



1. ........................



2. ........................

# Model Exam 2

## on Concept (2.2)

Total mark

15

**1 (A) Put (✓) or (X) :** *(5 marks)*

1. The roof of desert home is made up of strong stones to protect it from snow. ( )
2. All physical properties of matter can be measured. ( )
3. Iron spoon is attracted to the magnet. ( )
4. From the chemical properties of helium is that it is not flammable. ( )

**(B) Give a reason for the following :**

The roof of tropical rainforest home is made of leaves and sticks.

.............................................................................................................................

**2 (A) Complete the following sentences using words below :** *(5 marks)*

**(temperature – chemical – climate – mass)**

1. Heluim is not flammable, this property is considered as a .................. property.
2. By decreasing the speed of particles of a matter its .................. will decrease.
3. We can use different materials to make a roof, depending on the .................. where the home is located.
4. If you eat a small piece from a banana, so the .................. of the remaining piece of banana will decreases.

**(B) What happens to ...?**

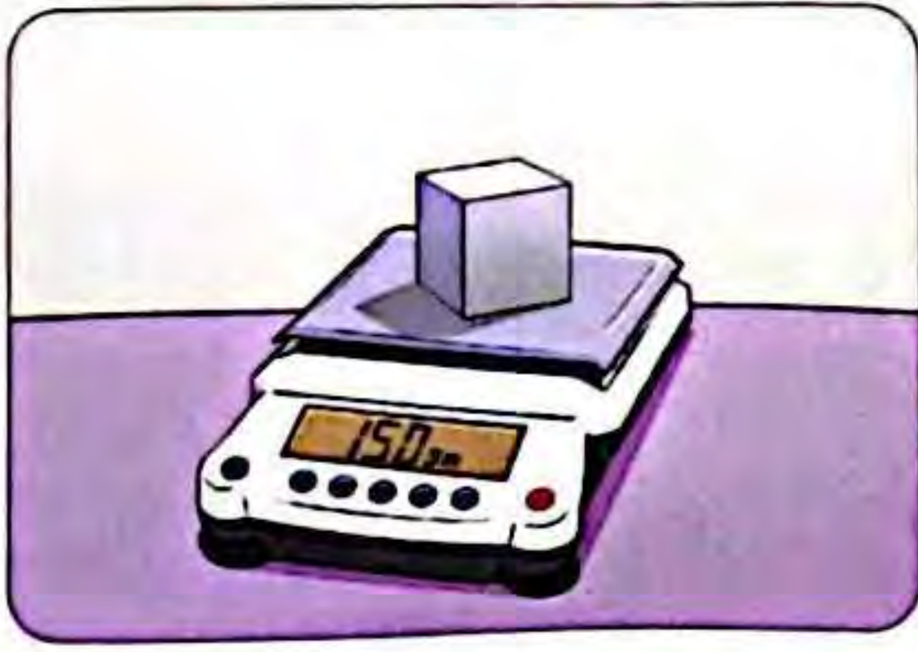
The temperature of a matter if the speed of its particles decreases.

.............................................................................................................................

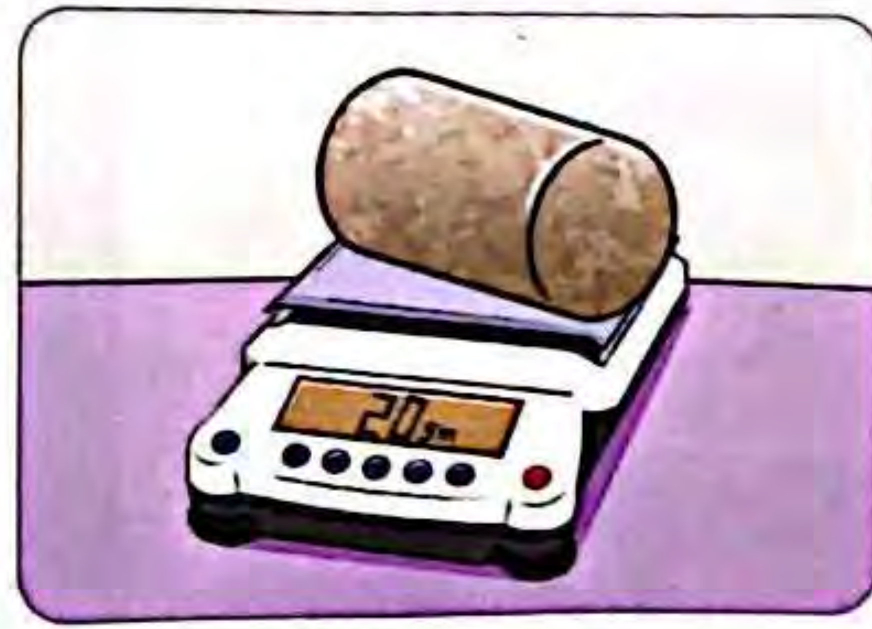
**3 (A) Write the scientific term of each of the following :** *(5 marks)*

1. The properties of matter you can observe by using your five senses. (.......................)
2. The property of matter which is measured by the balance. (.......................)
3. It is a light gas which is used in filling blimps. (.......................)
4. The ability of material to transfer heat and conduct electricity. (.......................)

## (B) Look at the following figures, then choose the correct answer :



Material (A) Iron cube



Material (B) Piece of cork

1. Material .................. has the largest volume.

   (A – B)

2. Material .................. has the largest mass.

   (A – B)

3. Material .................. is attracted to the magnet.

   (A – B)


4. Material .................. floats on the surface of water.

   (A – B)

Concept

# 2.3 Comparing Changes in Matter





## Learning outcomes

**By the end of this concept, your child will be able to :**

- Explain the relationship between changes in temperature, states of matter and mass.
- Identify the causes of changes in the physical and chemical properties of matter.
- Investigate what happens when two or more substances are mixed.
- Classify mixtures and compounds based on what happens when they are combined.

## Key vocabulary

- Chemical change
- Chemical properties
- Compound
- Physical change
- Thermal energy
- Water vapor
- Energy
- Friction
- Heat
- Light
- Melt
- Mixture

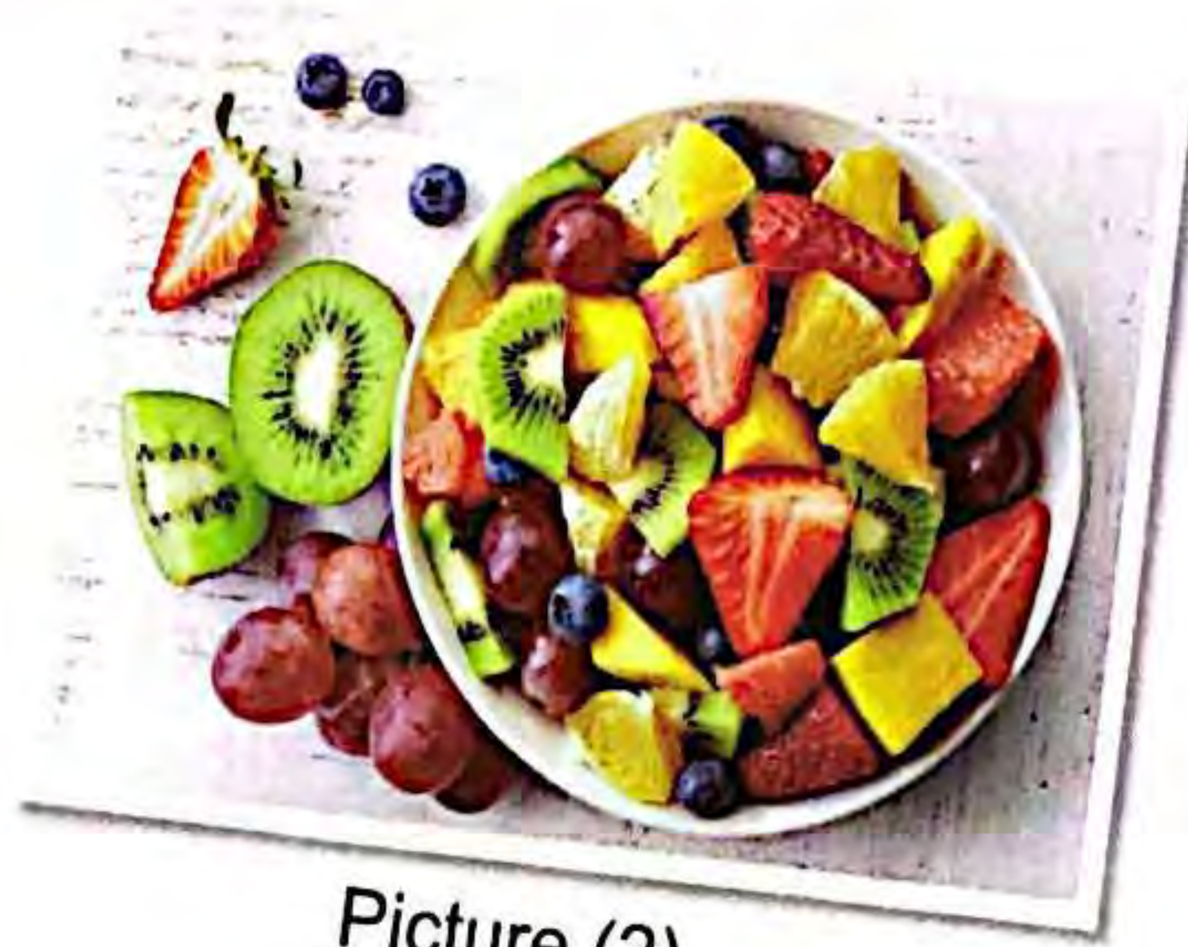
# Notes For Parents On Concept (2.3)

| Lessons | Activities | What you should do with your child |
|---|---|---|
| 1 | Activity 1 | Explain to your child what happens to the mass of a matter when it is heated, cooled or mixed with other substances. |
| | Activity 2 | Discuss with your child about the meaning of melting matter. |
| | Activity 3 | Explain to your child how the motion of the particles of a matter is related to the thermal energy of this matter. |
| 2 | Activity 4 | Discuss with your child that the temperature of the matter affects on the state of the matter. |
| | Activity 5 | Explain to your child how changing of states of matter happens. |
| 3 | Activity 6 | Discuss with your child about the difference between mixture and compound. |
| | Activity 7 | Explain to your child how the masses of substances do not change after mixing with other substances even if there are changes in their properties. |
| 4 | Activity 8 | Explain to your child the meaning of the physical changes and some examples of the physical changes. |
| | Activity 9 | Explain to your child how chemical changes affect the substances producing new substances with new properties. |
| | Activity 10 | Explain to your child that we can differentiate between chemical and physical changes using some evidences. |
| 5 | Activity 11 | Help your child to think like a scientist by answering a question about one of the main points of this concept then write his/her claim, evidence and the scientific explanation. |
| | Activity 12 | Let your child think about how important the desalination is and how it helps people to survive. |

# LESSON ONE

## Activity 1 Can You Explain ?


Picture (1)


Picture (2)

- In the previous concepts, you have learned that there are different states of matter and each matter takes up space and has mass.
- Also, you have learned that each matter has its own physical and chemical properties.
- The pictures above show that matter can be changed to different states as in picture (1) and matter can be mixed with other matter as in picture (2).

**▶ What happens to the mass of a matter when it is heated, cooled or mixed with other substances ?**

- The mass of any matter does not change when it is heated, cooled or mixed with other matter such as :
  - In picture (1), when ice cubes are heated and changed to water, the mass does not change.
  - In picture (2), the mass of any of the fruits before mixing with other fruits is the same after mixing with other fruits.

**▶ In this concept, we will study :**

- Temperature and state of matter.
- Mixtures.
- Properties of mixtures.
- Physical changes in our lives.
- Chemical changes.

| mixture خليط | heated يُسخن | cooled يُبرد |
|---|---|---|

## Activity 2 Melting Matter

▶ **Put the suitable word from those between brackets under the suitable picture:**

**(Liquid – Gas – Solid)**


........................ state


........................ state


........................ state

- Water is a matter that can be found in the three states of matter which are solid, liquid and gas states.
- Imagine that you forget a bowl contains ice cubes in a hot place, you will find water in the bowl instead of ice cubes. That means the ice melts and is turned into water.



**Melting :**

It is a process in which a matter is changed from solid state to liquid state when its temperature increases (by heating).



**Note**

Solid matter should be kept below certain temperature to stay in solid state.



### Check your understanding

▶ **Complete :**

1. Ice is the ...................... state of water.
2. Melting is the change of matter from ...................... state to ...................... state by heating.

▶ **Put (✓) or (✗) :**

1. Water vapor is the solid state of water. ( )
2. When heating ice, it changes from a liquid state to a solid state. ( )

| | | | |
|---|---|---|---|
| melting | ذوبان | bowl | إناء |
| instead of | بدلًا من | hot | حار |

# Activity 3 Particles

## Thermal energy

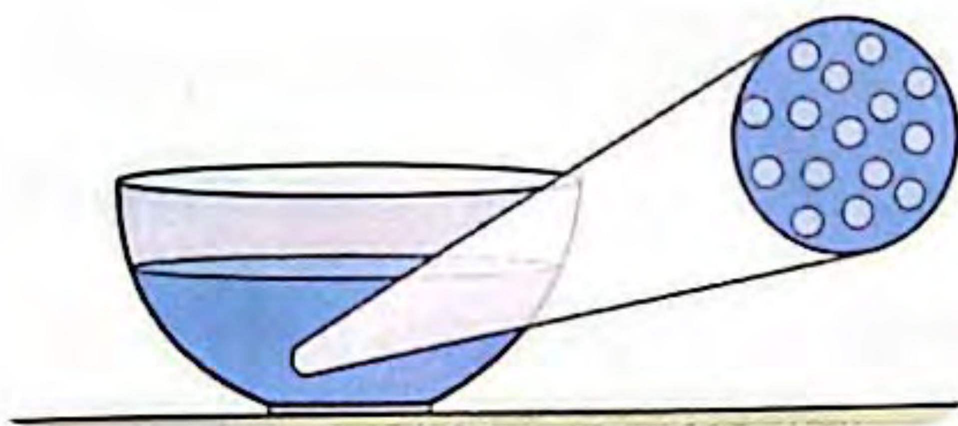


- Heat is not a physical thing (material) but it is a form of energy known as "thermal energy".
- We use thermal energy every day in many things such as cooking food and warming homes.
- The thermal energy from the Sun keeps living things on the Earth alive.

## Particles in motion

- As you have studied in the previous concept that any matter is made up of very small particles.
- Particles in matter are always in motion state even in solids that their particles are close together.

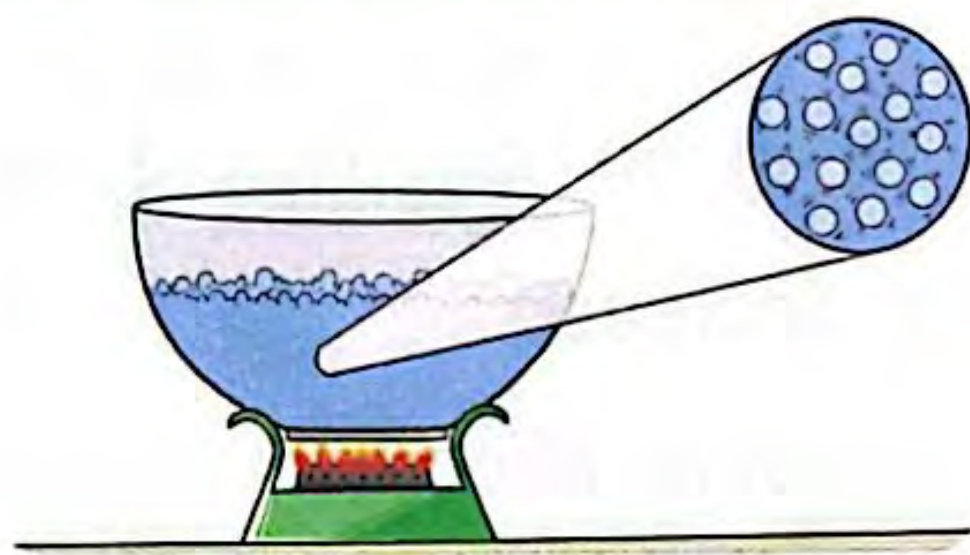
### ▶ The effect of thermal energy on the motion of particles :



Water before heating

- Particles in matter have energy that make them able to move, vibrate and spin around.

By heating the water →



Water during heating

- When particles of matter absorb more thermal energy, they move, vibrate and spin around faster that causes this matter becomes warmer.



**Note**

Light energy is like thermal energy, as when particles of a matter absorb them, particles move, vibrate and spin faster.



## Check your understanding

In the Assessment Book :
Try to answer :
Self-Assessment 23

### ▶ Put (✓) or (✗) :

1. Thermal energy is a matter. (   )
2. When particles are warmed, they move slower and come close together. (   )
3. When particles absorb light energy, they move faster and spread out. (   )

| | | | | | |
|---|---|---|---|---|---|
| physical thing | شئ مادى | motion state | حالة حركة | spin around | يدور حول |
| warmer | أدفأ | come close | يقترب | light energy | طاقة ضوئية |
| vibrate | يهتز | absorb | يمتص | faster | اسرع |
| spread | ينتشر | | | | |

# Exercises on Lesson 1

● Understand ● Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. When ice melts, it turns from .......... state to .......... state.
   a. liquid – solid b. solid – liquid c. liquid – gas d. solid – gas
2. Ice can turn into water by ..........
   a. cooling. b. freezing. c. rusting. d. heating.
3. The source of thermal energy which keeps living things alive on the Earth is the ..........
   a. moon. b. fire. c. heater. d. Sun.
4. When the water is heated, its particles .......... *(Damietta 2023)*
   a. move slower. b. move faster.
   c. move with the same speed. d. do not move.
5. When we heat a liquid, the distance between its particles will ..........
   a. decrease. b. increase.
   c. not be affected. d. become zero.
6. When ice is kept in a cold temperature, it ..........
   a. turns into water. b. turns into steam.
   c. remains as it is. d. becomes unclear.
7. Ice changes from solid state to liquid state by increasing its ..........
   a. length. b. mass. c. temperature. d. volume.
8. When particles of water absorbs light energy, they will ..........
   a. move faster. b. vibrate slower. c. spin slower. d. become close together.
9. Which of the following matter particles are very close together ? ..........
   a. Oxygen gas. b. Water. c. Oil. d. Wood. *(Alex. 2023)*
10. All the following happen to the particles of oil when it is heated, except that they .......... *(Gharbia 2023)*
    a. spin around faster. b. move faster.
    c. vibrate less. d. vibrate faster.

## 2 Put (✓) or (✗) :

1. An ice cream turns into liquid by cooling. ( )
2. If we increase the temperature of some pieces of ice, they will melt. ( )
3. When particles of a matter absorb thermal energy, they move slower. ( ) *(Alex. 2023)*
4. If a matter absorbs light energy, its particles vibrate and move faster. ( )
5. Particles of solid matter are spread out from each other. ( )
6. The mass of an amount of apple juice will change if we mix it with water. ( )
7. The mass of some pieces of ice will be the same when they are melted. ( )

## 3 Complete the following sentences :

1. Melting process occurred by .................. the temperature of the matter.
2. When ice melts, it changes from a .................. state to a .................. state.
3. The form of energy which is used in cooking food and warming homes is ..................
4. The distance between particles of solid matter is very ..................
5. When an amount of a liquid is heated, the speed of its particles will ..................
6. The process by which a matter is changed from solid state to liquid state is known as ..................process. *(Cairo 2023)*
7. When we heat ice cream, it .................. and becomes liquid.
8. When we keep some of ice cubes in a low temperature, they don't ..................
9. When a matter absorbs light energy, its temperature will .................. and becomes warmer.

## 4 Give reasons for :

1. Ice is turned into water when it is placed in a warm room.

.......................................................................................................

2. When particles of water absorb thermal energy, the water becomes warmer. *(Ismailia 2023)*

.......................................................................................................

## 5 What happens to ...?

1. Some ice cubes if we increase their temperature.

.......................................................................................................

2. The motion of water particles if we heat an amount of water. *(Giza 2023)*

.......................................................................................................

**6** **Look at the following pictures, then complete the following sentences :**


Picture (1)


Picture (2)


Picture (3)

1. Picture (.................) is considered as a solid state of water.
2. Picture (.................) is considered as liquid state of water.
3. Picture (.................) is considered as gas state of water.
4. Picture (.................) $\xrightarrow[\text{Process}]{\text{Melting}}$ picture (.................).

## Activity 4 Temperature And State of Matter

▸ **Put (✓) or (✗) :**

1. Matter cannot be changed from one state to another. ( )
2. When heating ice cubes, they will melt. ( )

- You have learned that the temperature is a measure of how quickly the particles in a substance are moving.

**So,** the temperature measures how much energy the particles in a substance have.

### Temperature and states of matter

- Changes of states of matter are often affected by the changes in temperature of matter which cause changes in energy of particles of that matter.

| Melting | Freezing |
|---|---|
| ▸ In this process, the particles of a solid matter gain energy.<br>▸ This causes particles to move around more and their temperature increases.<br>▸ So, the matter changes to liquid state.<br>▸ For example :<br>• When the temperature of solid ice increases above 0°C, its particles gain energy and they move around more, so the ice changes to liquid water. | ▸ In this process, the particles of liquid matter release energy.<br>▸ This causes particles to move slower and their temperature decreases.<br>▸ So, matter changes to solid state.<br>▸ For example :<br>• When the temperature of liquid water decreases below 0°C, its particles release energy and they move slower, so liquid water changes to solid ice. |
| Melting → | Freezing → |

**Notes**

1. 0°C is known as the freezing point of water.
2. Water is found in liquid state between 0°C and 100°C.
3. (°C) is the measuring unit of temperature.

| | | | | | |
|---|---|---|---|---|---|
| quickly | بسرعة | below | أدنى / أسفل | decrease | يقل |
| increase | يزيد | above | أعلى | freezing point | نقطة التجمد |

- Melting of ice and freezing of water are examples of a change in the state of matter.
- Changing the state of matter is considered as a "physical change".

**▶ But, what is meant by physical change ?**

**Physical change :**

It is a change in matter without any change in its structure.

Example : When chocolate melts, it changes from solid state to liquid state, but its taste, color and smell don't change.

- Physical changes are usually reversible such as melting is the reverse process of freezing.






**Check your understanding**

**▶ Complete :**

1. In freezing process, the particles of a liquid matter release energy and their temperature ..................
2. The changes in matter that do not change the structure of the substance are called .................. changes.

**▶ Put (✓) or (✗) :**

1. The temperature of matter does not affect the state of matter. ( )
2. In melting process, the particles of a liquid matter gain energy. ( )

structure ترکیب | reversible عکسی

## Activity 5 What's the Matter ? Changing States

- You have learned that matter can be changed from one state to another if its temperature changes.

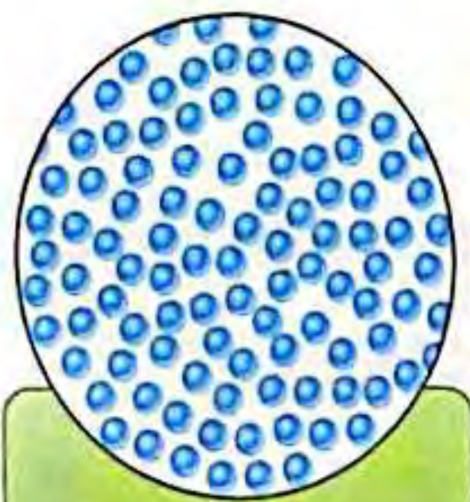
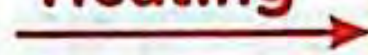
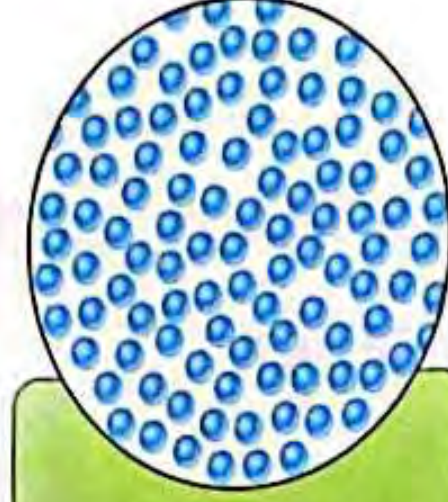
▶ **We will study changing of states that happen in water as an example of changing of states of matter.**

| Changing a solid to a liquid (Melting) | Changing a liquid to a solid (Freezing) |
|---|---|
| When placing a container of ice cubes on a hot stove : | When placing a water container in a freezer : |
| The ice **gains** thermal energy. | The water **loses** the thermal energy to the space in the freezer. |
| ⬇ | ⬇ |
| So, the particles of ice move **faster** and separate from each other. | So, the particles of water move **slower** and get close together. |
| ⬇ | ⬇ |
| This causes the change of the ice from solid state to liquid state (water). | This causes the change of the water from liquid state to solid state (ice). |
| Particles of ice — Heating → Particles of water | Particles of ice ← Cooling — Particles of water |

**Give** a reason for :

**Freezing process causes decrease in the speed of the particles of matter.**
Because in freezing process the particles of matter lose the thermal energy , so the particles move slower.

| | | |
|---|---|---|
| stove موقد | placing وضع | freezer مجمد |
| freezing تجمد | | |

| Changing a liquid to a gas (Evaporation) | Changing a gas to a liquid (Condensation) |
|---|---|
| When boiling a water container on a hot stove : | When water vapor touches a cold lid : |
| The water gains thermal energy.  So, the particles of water move more faster and separate much more from each other.  This causes the change of the water from liquid state to gas state (water vapor). | The water vapor loses the thermal energy to the cold lid.  So, the particles of water vapor move slower and get close together.  This causes the change of water vapor from gas state to liquid state (water). |
| Particles of water  Heating  Particles of water vapor  | Particles of water  Cooling  Particles of water vapor  |

**Note**

Water vapor differs from steam, where :

- When water boils, it produces water vapor which is invisible in the air.
- When the water vapor hits cooler air, it condenses into tiny water droplets forming a visible small white cloud known as steam.



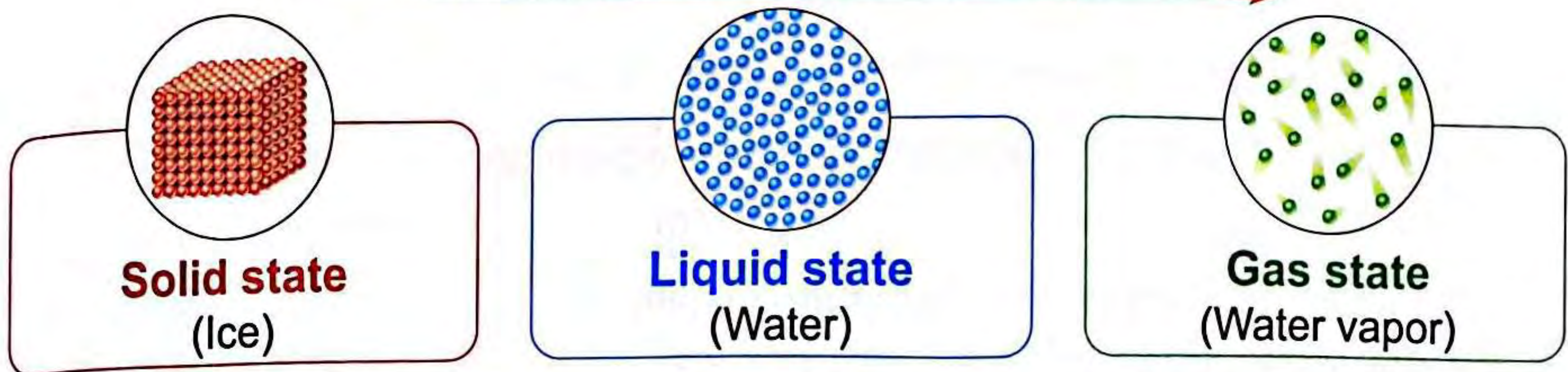
## Give a reason for :

**We can see steam during cooking food.**

Because when the water vapor hits cooler air, it condenses into tiny droplets which looks like small white clouds that are visible.

| | | | |
|---|---|---|---|
| evaporation تبخير | condensation تبخير | condense يتكثف | lid غطاء |
| cloud سحابة | tiny صغير | | |

- **We can summarize the previous in the following diagram :**






## Check your understanding

- **Put (✓) or (✗) :**

1. By heating water, it changes into ice. ( )
2. When water gains thermal energy it changes into water vapor. ( )

**In the Assessment Book :**
**Try to answer :**
Self-Assessment (24)

# Exercises on Lesson 2

● Understand ● Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. Freezing of liquid chocolate needs .......... temperature.
   a. high b. low c. warm d. very high
2. The reversible changes of matter are usually ..........
   a. physical changes only.
   b. chemical changes only.
   c. both physical and chemical changes.
   d. neither chemical nor physical changes.
3. In freezing process, the particles of matter lose energy and ..........
   a. move with high speed. b. move with very high speed.
   c. move with low speed. d. don't move.
4. Condensation changes the matter from .......... state to .......... state. *(Cairo 2023)*
   a. solid – liquid b. liquid – gas c. gas – liquid d. liquid – solid
5. When we boil water, it will ..........
   a. condense. b. freeze. c. melt. d. evaporate.
6. When ice cubes gain .......... energy, they turn into water.
   a. sound b. potential c. electrical d. thermal
7. Physical changes of matter include .......... *(Fayoum 2023)*
   a. melting only. b. freezing only.
   c. both melting and freezing. d. neither melting nor freezing.
8. Increasing the temperature of a matter means that its particles ..........
   a. have low energy. b. have high energy.
   c. have very low energy. d. don't have energy.
9. Ice is turned into .......... when its temperature is between 0°C and 100°C.
   a. solid state b. liquid state c. gas state d. water vapor
10. When the temperature of water is decreased below 0°C, it will turn into ..........
    a. water vapor. b. clear water. c. colored water. d. ice.
11. Physical processes which need heating include ..........
    a. melting and freezing. b. melting and condensation.
    c. melting and evaporation. d. freezing and evaporation.
12. To change water from solid state to liquid and then to gas state, we need to .......... the temperature.
    a. fix b. increase c. decrease d. reduce

13. The two processes which cause particles of matter get close together are ..........
   a. freezing and condensation.   b. freezing and melting.
   c. freezing and evaporation.   d. melting and condensation.

14. In cold weather, drops of water are .......... on the windows of houses. *(Giza 2023)*
   a. melted   b. evaporated   c. condensed   d. freezed

## 2 Choose from columns (B) what suits it in column (A) :

| (A) | (B) |
|---|---|
| 1. Condensation | a. is the change of water from solid state to liquid state. |
| 2. Melting | b. is the change of water from gas state to solid state. |
| 3. Freezing | c. is the change of water from gas state to liquid state. |
| 4. Evaporation | d. is the change of water from liquid state to gas state. |
| | e. is the change of water from liquid state to solid state. |

1. ..............   2. ..............   3. ..............   4. ..............

## 3 Put (✓) or (X) :

1. When ice is heated, it will freeze. *(Giza 2023)* (   )
2. When a solid matter gains thermal energy, it will change into liquid state. (   )
3. Freezing takes place by cooling, while melting takes place by heating. (   )
4. Melting and freezing are reversible processes. (   )
5. Water remains liquid between 0°C and 100°C. (   )
6. Freezing means that matter changes from solid state to liquid state. (   )
7. Evaporation process means that matter changes from liquid state to gas state. (   )
8. When hot water vapor hits cooler air it forms steam. (   )
9. Increasing temperature means that particles of matter have low thermal energy. (   )
10. When the particles of matter move with high speed, its temperature will decrease. *(Cairo 2023)* (   )
11. When chocolate melts, its particles get closer together. (   )

## 4 Write the scientific term of each of the following :

1. They are changes in matter which are usually reversible and don't affect its structure. *(Damietta 2023)* (....................)

2. It is the process by which the particles of matter gain energy and changes from solid state to liquid state. *(Cairo 2023)* (..................)

3. It is the process by which the particles of matter lose energy and changes from liquid state to solid state. *(Alex. 2023)* (..................)

4. The state of water when its temperature is between 0°C and 100°C. (..................)

## 5 Complete the following sentences :

1. Matter can be changed from one state to another by changing its ................ *(Alex. 2023)*
2. Solid state is turned into liquid state by ................ process.
3. Liquid state is turned into solid state by ................ process.
4. By changing the ................ of matter, its particles speed will change.
5. 0°C is the freezing point of ................
6. By decreasing the temperature of water vapor, it releases ................ energy and changes into water.
7. When a chocolate cube is exposed to sun rays, its temperature will ................ and it will become liquid.
8. When we put a bottle containing water in freezer its temperature will ................ and becomes solid. *(Luxor 2023)*
9. Water can change from the liquid state to ................ state by increasing its temperature.
10. The movement of particles of matter increases in case of ................ and ................ processes.
11. The distance between particles of water is very small in case of its ................ state.

## 6 Give reasons for :

1. When the temperature of ice cubes increases, they melt. *(Dakahlia 2023)*

..........................................................................................................................

2. Both melting and freezing processes are considered as physical changes.

..........................................................................................................................

3. Formation of water drops when water vapor touches a cold surface.

..........................................................................................................................

## 7 What happens to ...?

1. The particles of water when its temperature is decreased below 0°C.

.................................................................................................................................

.................................................................................................................................

2. The particles of water when we increase its temperature above 100°C.

.................................................................................................................................

.................................................................................................................................

## 8 Use the following pictures to complete the following sentences to explain melting and freezing processes : *(Minia 2023)*


Picture (A)


Picture (B)


Picture (C)


Picture (D)

1. During melting process, picture (..................) changes into picture (..................) with the help of the device in picture (..................).
2. During freezing process, picture (..................) changes into picture (..................) with the help of the device in picture (..................).

# LESSON THREE

## Activity 6 Mixtures

▶ **Put (✓) or (✗) :**

**1.** When mixing salt and water, the salt loses its salty taste. ( )

**2.** You can see the components of fruit salad by your eyes. ( )

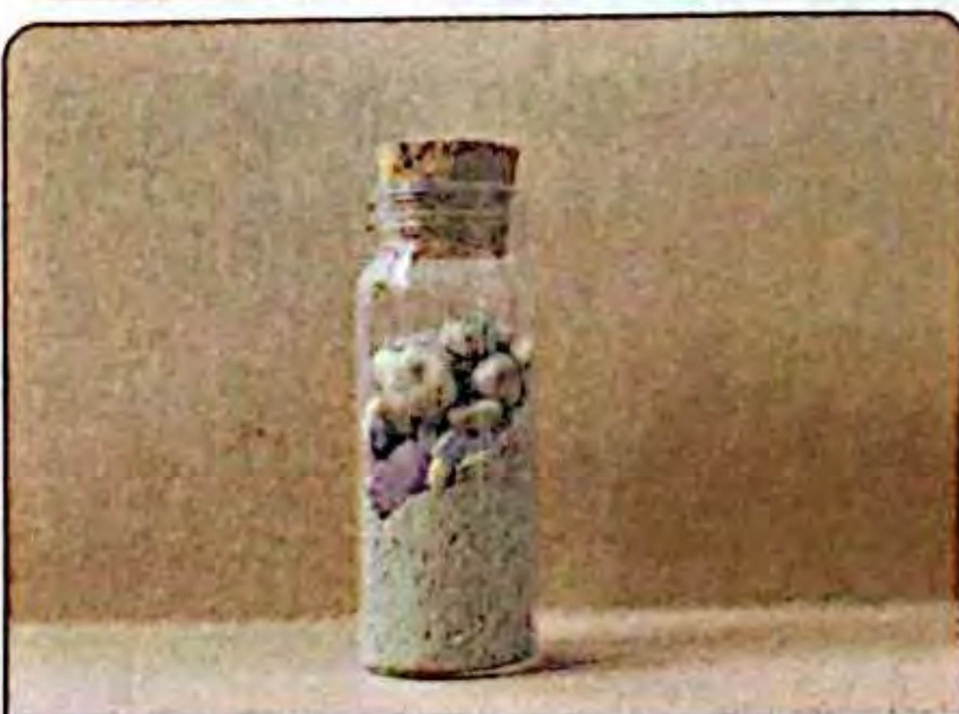
• Most things in nature are "Mixtures", but there are other things in our world known as "Compounds".

### Mixtures and Compounds

| Mixture | Compound |
|---|---|
| • A mixture is a matter formed of two or more materials.<br>• The materials that form a mixture don't combine chemically and mixing them does not change them into new substances. | • A compound is a matter formed of two or more materials.<br>• The materials that form a compound combine chemically to form a completely new substance. |

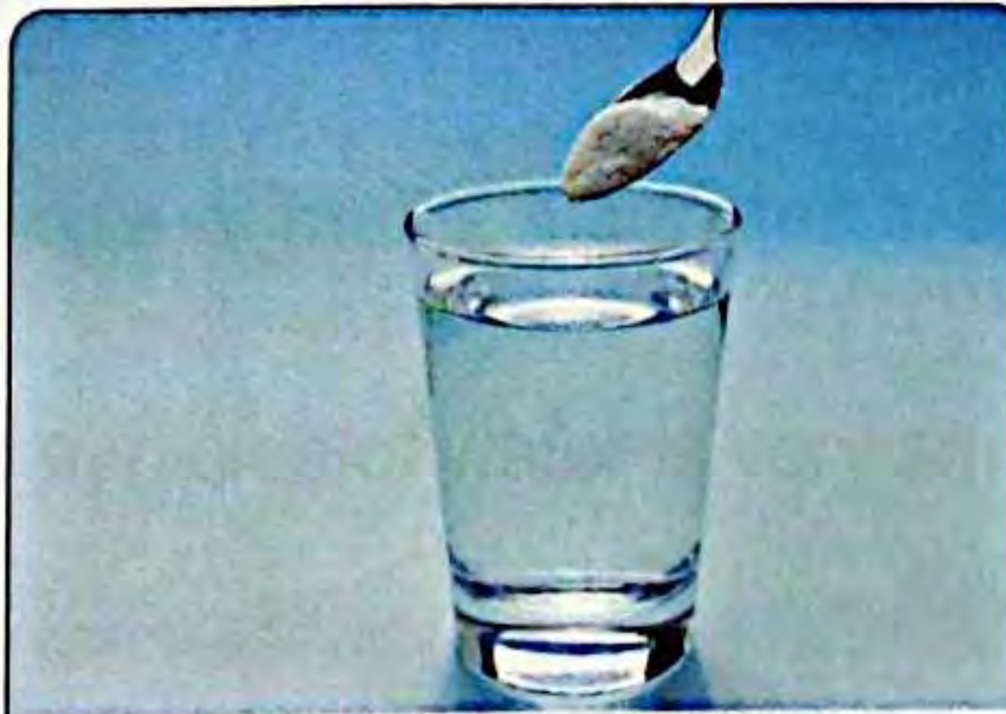
### Mixtures can be made of

**Solid materials**



Example : Sand and rocks

**Solid and liquid materials**



Example : Salty water

**Gas materials**



Example : Air

### What happens if ... ?

**You mix an amount of apple juice with an amount of orange juice.**

A mixture of apple juice and orange juice is formed, which don't combine chemically and both apple juice and orange juice keep their taste and properties.



keep يحتفظ | combine يمزج

**Note**

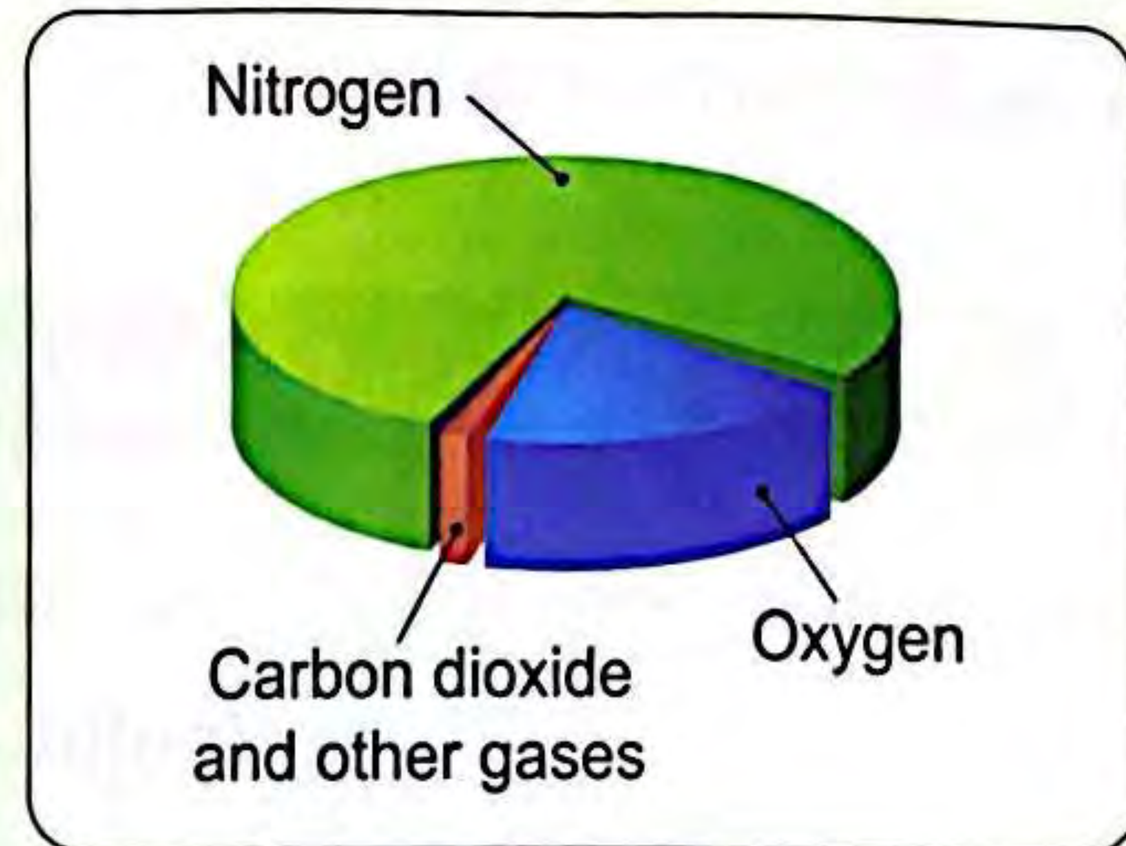
**Components of some mixtures :**

- Can be seen by eyes, such as the components of a mixture of nuts.



Mixture of nuts

- Cannot be seen by eyes, but we need special equipments to see its components, such as the components of air that is formed of some gases.




Air components

## Properties of mixture

- It consists of two or more materials.
- All materials that form a mixture don't combine chemically.
- Each material in a mixture keeps its properties that you can use to identify it, such as :
  - Sugar does not lose its sweetness when it is dissolved in water.
  - In fruit salad, you can identify each type of fruit in the fruit salad.
- The components of a mixture can be separated after mixing them.

## Separating mixtures

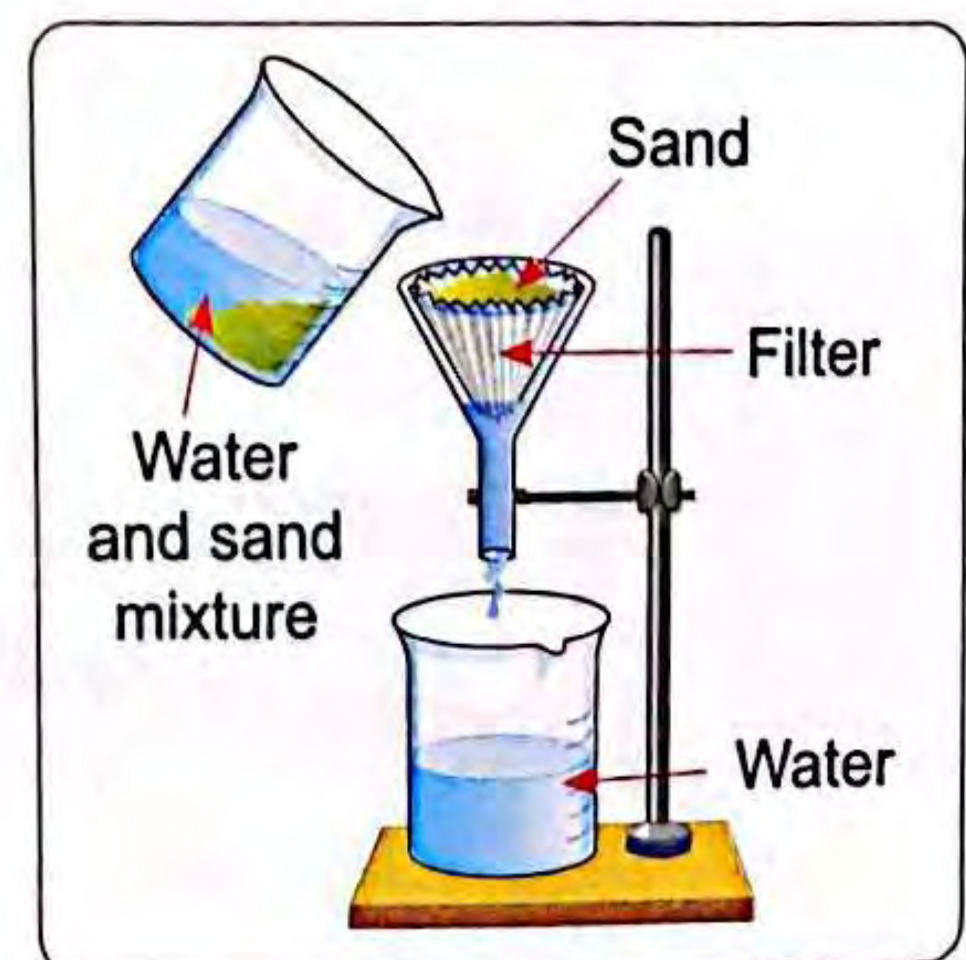
**There are many methods to separate the components of mixtures, such as :**

### Filtration :

A filter can be used to separate a mixture if one material in the mixture has smaller particles than the particles of other materials.

Example :

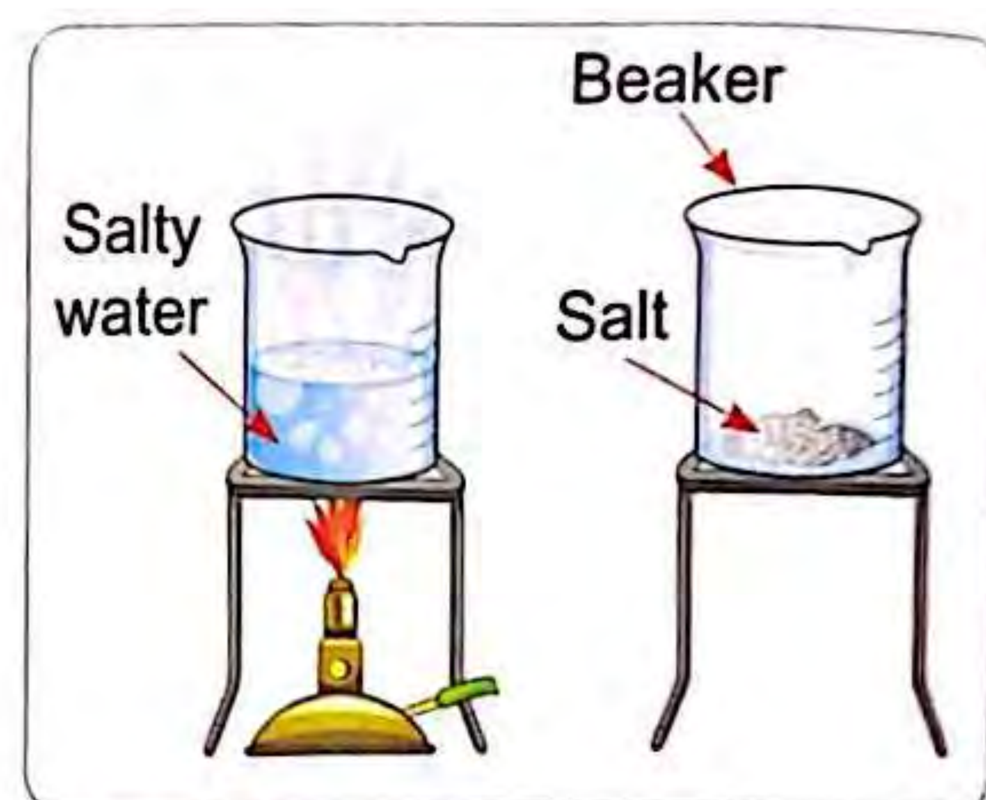
Separating sand from a mixture of water and sand.




| | | | |
|---|---|---|---|
| separating | فصل | filtration | ترشيح |
| equipments | معدات | sweetness | حلاوة |

### Evaporation :

Evaporation can be used to separate materials that evaporate at different temperatures.




Example :

Separating the salt from a mixture of salty water, by heating the salty water, the water will evaporate leaving the salt in the beaker.



## Check your understanding

**Complete using the words between brackets :**

**(solid – compound – filters)**

1. The matter that is formed of two materials or more that are combined chemically is called a .................
2. We can use ................. to separate mixtures that one of its materials has smaller particles than the others.
3. Sand and rocks are a mixture that is made of ................. materials.



beaker كأس | leaving ترك

## Activity 7 Mixing It Up with Mass

- You have learned that when we mix substances, mixtures or compounds are formed.

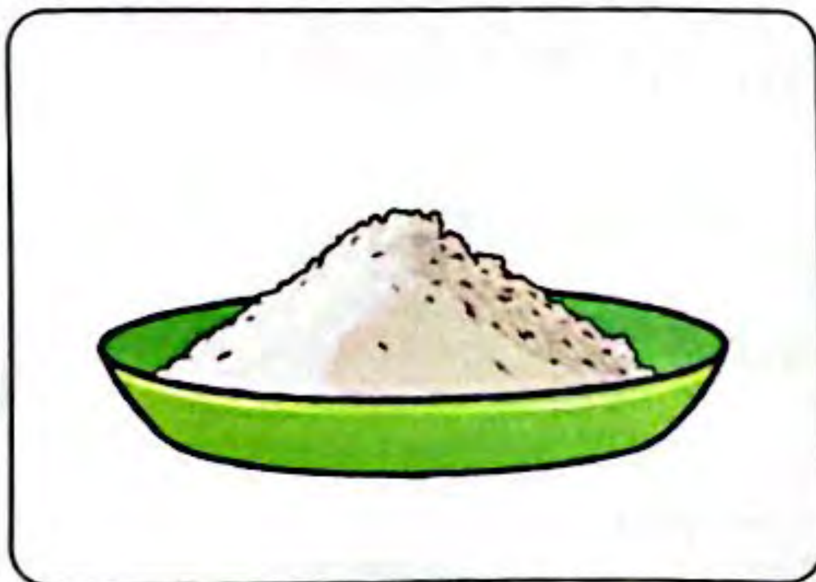
**So,** when mixing substances, what happens to their masses after mixing when their properties change and when their properties don't change ?

- **To answer these questions, we can do the following experiments.**

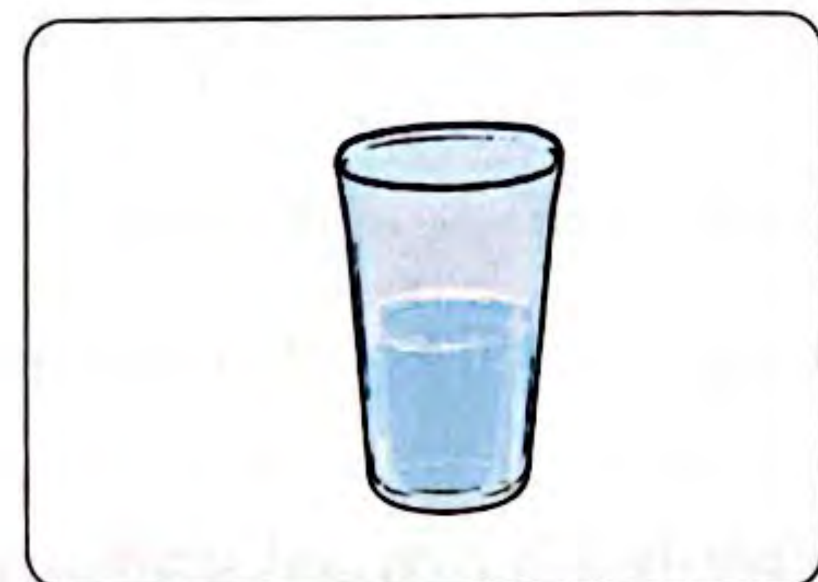
### Experiment 1

To show what happens to masses of substances after mixing when their properties don't change after mixing.

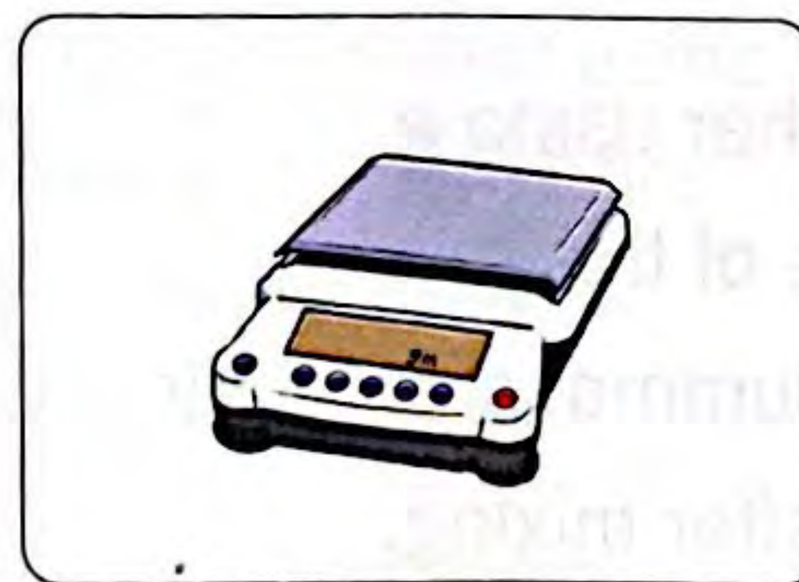
#### Tools

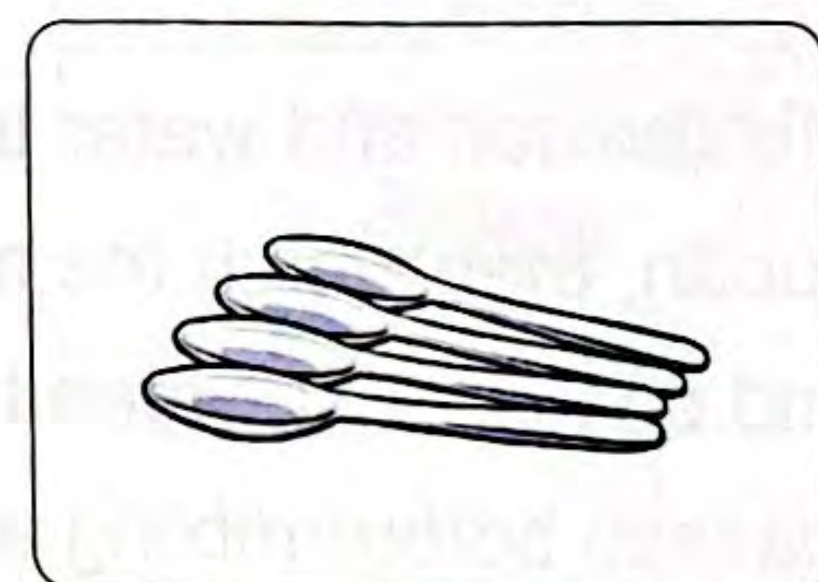

Salt


Pepper


Water

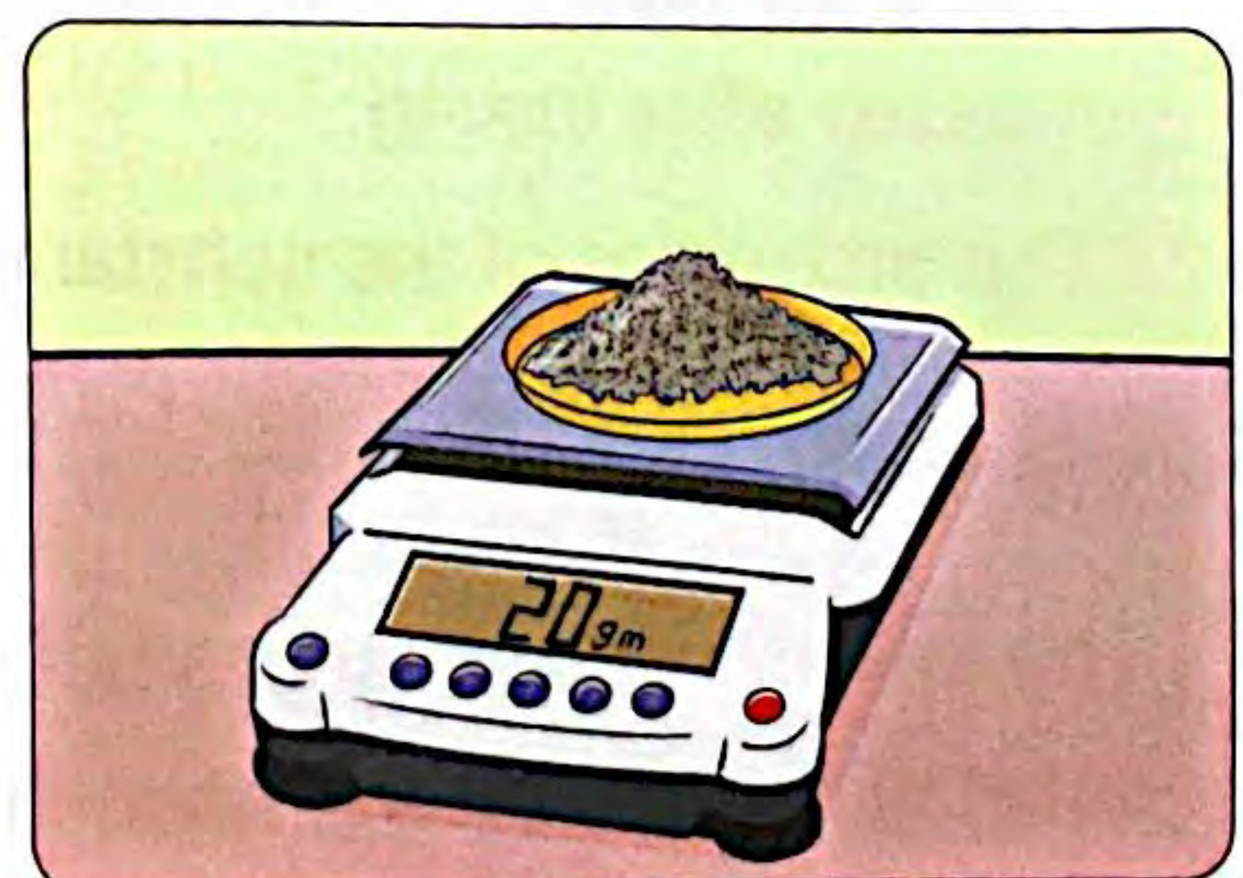

Oil


Balance


Spoons

#### Steps

1. Weigh 10 gm. of salt and 10 gm. of pepper using the balance.
2. Mix the salt and pepper together using a spoon, then weigh the mass of this mixture and compare between the summation of their masses before and after mixing.



Salt and pepper

| | | | |
|---|---|---|---|
| pepper | فلفل أسود | weigh | يزن |
| compare | يقارن | summation | مجموع |

## Observations

- The summation of their masses before mixing equals the summation of their masses after mixing.
- The properties of the substances don't change after mixing.

3. Weigh 10 gm. of water and 10 gm. of oil using the balance.
4. Mix the water and oil together using a spoon, then weigh the mass of this mixture and compare between the summation of their masses before mixing and after mixing.



Water and oil

## Observations

- The summation of their masses before mixing equals the summation of their masses after mixing.
- The properties of the substances don't change after mixing.

5. Weigh 10 gm. of salt and 10 gm. of water using the balance.
6. Mix the salt and water together using a spoon, then weigh the mass of this mixture and compare between the summation of their masses before mixing and after mixing.



Salt and water

## Observations

- The summation of their masses before mixing equals the summation of their masses after mixing.
- The properties of the substances don't change after mixing.

## Conclusion

The masses of substances before mixing are equal to the masses of these substances after mixing when their properties don't change (when forming a mixture).

## Experiment 2

To show what happens to masses of substances after mixing when their properties change after mixing.

### Tools

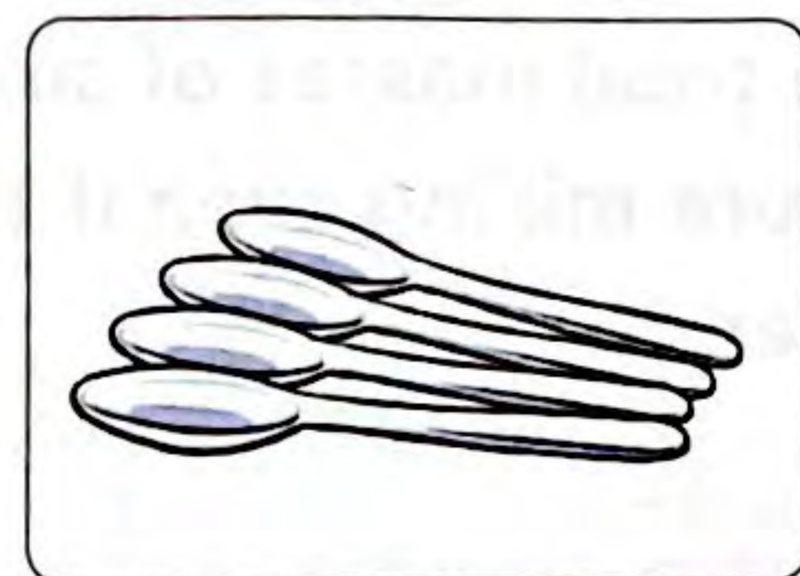

Vinegar


Baking soda


Iodine


Cornstarch


Balance


Spoons

### Steps

1. Weigh 10 gm. of vinegar and 10 gm. of baking soda using the balance.
2. Mix the vinegar and baking soda together using a spoon, then weigh the masses of them after mixing and compare between their masses before mixing and after mixing.



Vinegar and baking soda

### Observations

- The summation of their masses before mixing equals the summation of their masses after mixing.
- A gas formed causing bubbles which means that the properties of the substances change after mixing.

3. Weigh 10 gm. of cornstarch and 10 gm. of iodine using the balance.
4. Mix the cornstarch and iodine together using a spoon, then weigh the masses of them after mixing and compare between their masses before mixing and after mixing.



Cornstarch and iodine

## Observations

- The summation of their masses before mixing equals the summation of their masses after mixing.
- A compound formed and its color is dark blue which means that the properties of the substances change after mixing.

## Conclusion

The masses of substances before mixing are equal to the masses of these substances after mixing when their properties change (when forming a compound).

**From all the previous experiments, we can conclude that :**

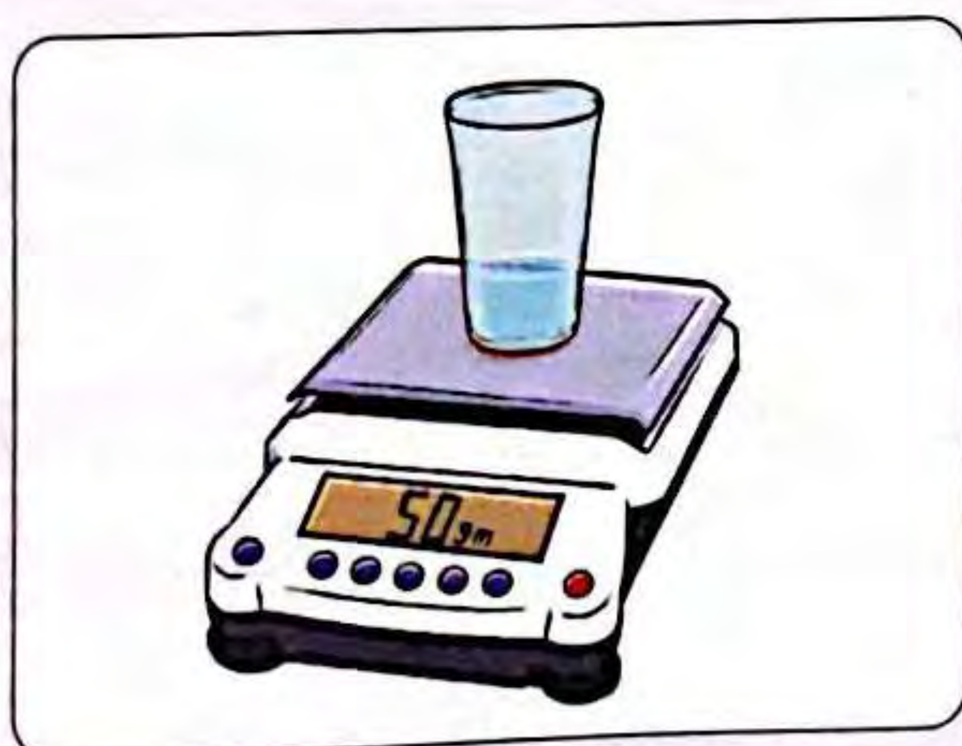
**The total masses of substances after mixing is equal to their total masses before mixing even if their properties change as they react with each other.**



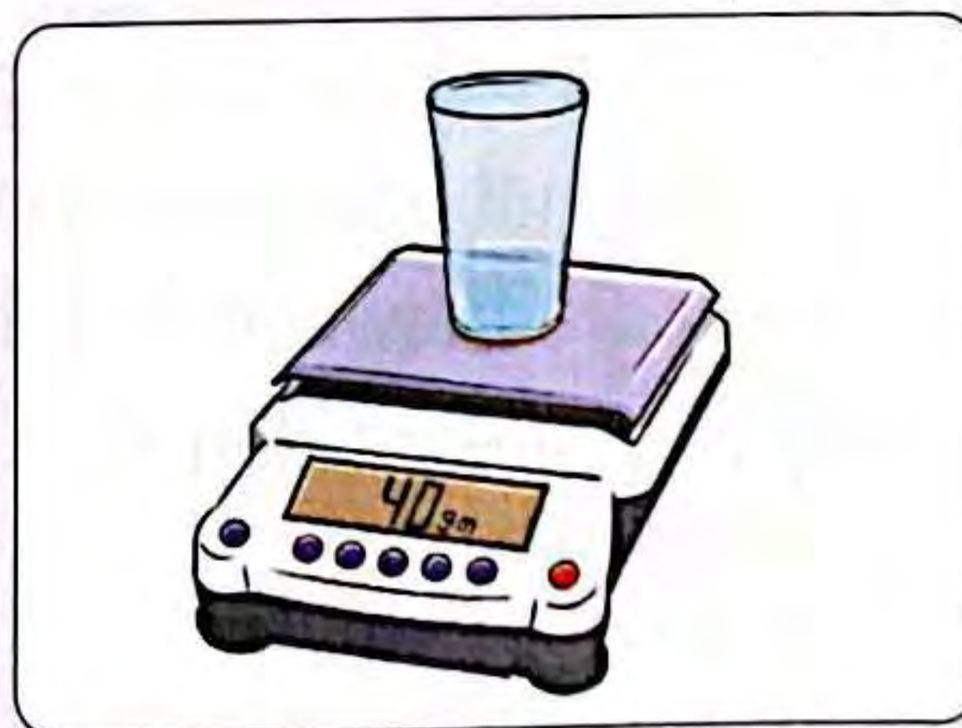
## Check your understanding

### Choose :

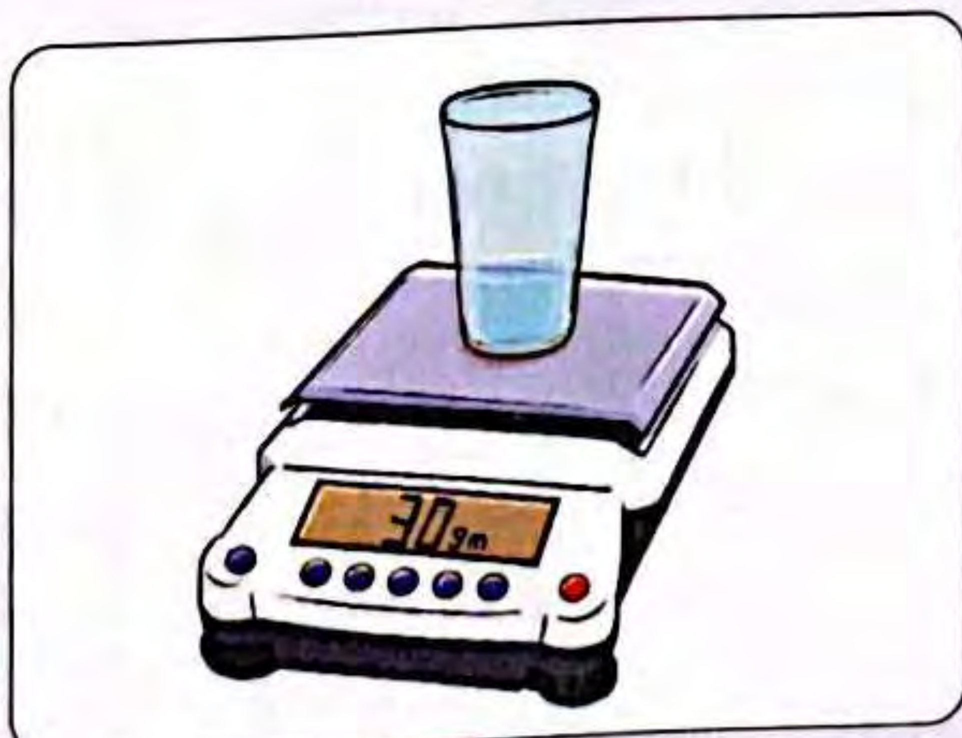
The balance that represents the correct mass of a mixture of 10 gm. of salt and 30 gm. of water is balance number ..........



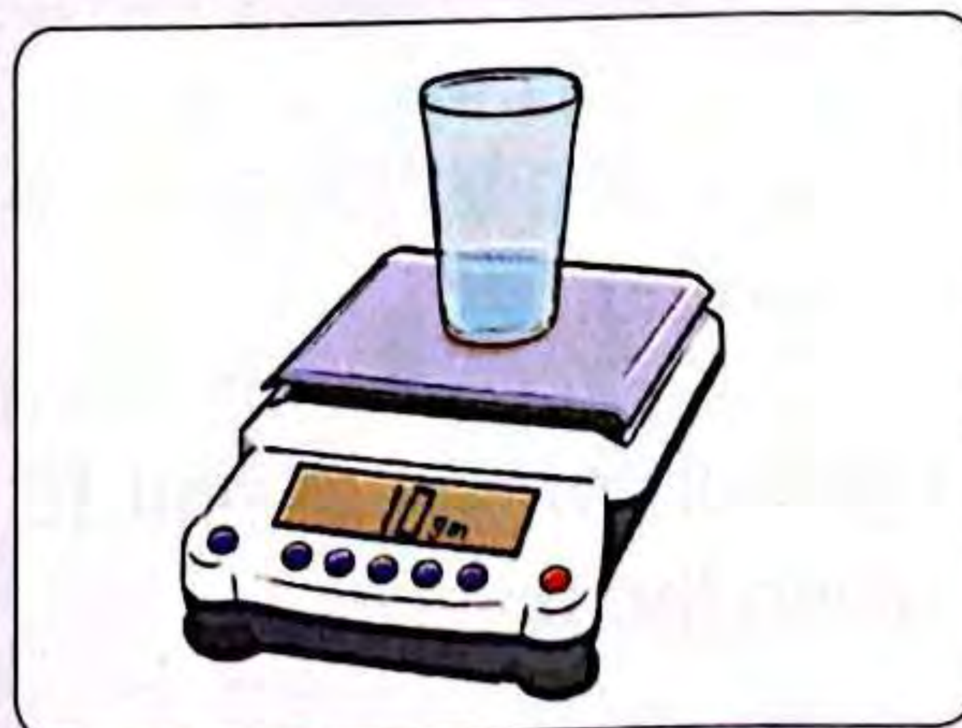

(1)




(2)




(3)




(4)

**In the Assessment Book :**
**Try to answer :**
Self-Assessment (25)

react يتفاعل | dark blue أزرق غامق

# Exercises on Lesson 3

● Understand ● Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. Among mixtures which are made up of solid materials only is the mixture of ..........
   a. salt and water. b. sand and rocks.
   c. suagr and water. d. oxygen and helium.

2. Salt can be separated by .......... of salty water. *(Damietta 2023)*
   a. melting b. evaporation c. freezing d. condensation

3. By adding baking soda to vinegar, a .......... is formed.
   a. powder b. compound c. mixture d. solid matter

4. By adding iodine to starch, the color of the formed compound will change into ..........
   a. dark blue. b. dark green. c. orange. d. yellow.

5. If we mix two equal masses of salt and oil so, their total mass will .......... after mixing.
   a. equal to zero b. decrease c. increase d. not change

6. To separate sand only from salty water, we can use .......... process. *(Cairo 2023)*
   a. filtration b. evaporation c. melting d. freezing

7. A compound has all the following properties, except that its components ..........
   a. combine chemically. b. form new substance.
   c. change in their shapes. d. do not change chemically or physically.

8. The .......... of iodine will not change after mixing it with starch.
   a. mass only b. color only
   c. color and mass d. properties and mass

9. If we have 6 gm of water and 6 gm of sugar, after mixing them the mass of whole mixture will be .......... gm.
   a. 15 b. 10 c. 12 d. 6

10. If we mix 150 gm of banana with 50 gm of apple, the mass of banana only will be .......... gm after mixing.
    a. 50 b. 100 c. 200 d. 150

## 2 Put (✓) or (✗) :

1. We can use evaporation process to form mixtures. ( )
2. The properties of the components of a mixture change after mixing them with each other. ( )
3. Evaporation and filtration are ways of mixtures separation. *(Cairo 2023)* ( )
4. The substances that form a compound combine physically forming a new substance. ( )
5. By adding iodine to starch, their masses and color will not change. ( )
6. You can see the different components of the salty water. ( )
7. Sand and rocks mixture is considered from solid and liquid mixtures. ( )
8. The mass and properties of oil will change when mixing it with vinegar. ( )
9. The properties of mango will be the same if we mix it with banana. ( )
10. By mixing some vegetables together their properties will change. ( )
11. If we add 10 gm of salt to 5 gm of pepper, the mass of mixture will be 15 gm. ( )
12. The mass of 50 gm of sugar will decrease by adding it to 100 gm of water. ( )

---

## 3 Write the scientific term of each of the following :

1. A matter that is formed when two or more materials combine chemically. *(Assiut 2023)* (....................)
2. It is the substance that consists of more than one matter and don't have any chemical change in their properties. (....................)

---

## 4 Complete the following sentences :

1. When two substances combine and form a new substance, this new substance is called a ..................
2. The mass of a mixed substance will not be changed during formation of .................. , but their properties will be changed.
3. By adding iodine to starch, their .................. will change into dark blue forming a new compound.
4. By mixing salt with pepper, a mixture is formed which has no change in the .................. and .................. of its components.
5. By adding baking soda to vinegar, the properties of the formed substance will be ..................
6. Salty water is a mixture that consists of salt which is a .................. state of matter and water which is a .................. state of matter.
7. To separate mud from salty water we can use .................. process. *(Alex. 2023)*
8. To separate salt from salty water we can use .................. process. *(Menofia 2023)*
9. The mass of salt in salty water will be .................. after the mixture is formed.

## 5 Give reasons for :

1. Fruit salad and salty water are considered as mixtures. *(Giza 2023)*

.....................................................................................................................................

2. Filtration process is used to separate soil from water.

.....................................................................................................................................

3. By adding baking soda to vinegar the properties of each of them are changed.

.....................................................................................................................................

.....................................................................................................................................

## 6 What happens to ...?

1. Salty water if heated for a long time. *(Minia 2023)*

.....................................................................................................................................

.....................................................................................................................................

2. The mass and properties of sugar when adding it to an amount of flour.

.....................................................................................................................................

.....................................................................................................................................

## 7 Look at the opposite mixture, then put (✓) or (✗) :



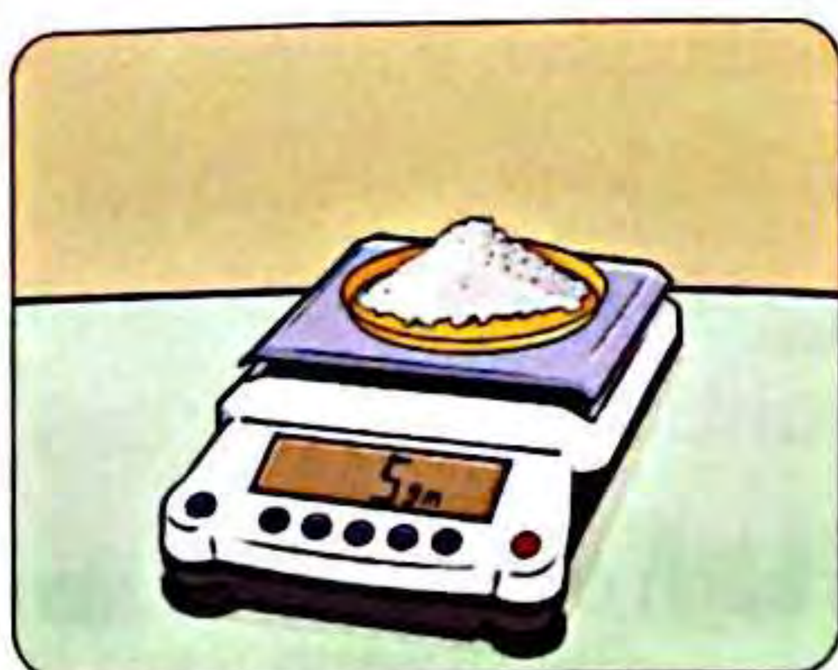
1. The components of this mixture combine chemically. (   )
2. The components of this mixture are solids only. (   )
3. The mixing process affects the properties of each component in this mixture. (   )

## 8 Mention the state of matter which forms the following mixtures by using the words below :

**(Solid and liquid – Gas – Solid – Liquid)**

| Fruit salad | Air | Oil in water | Sugar in water |
|---|---|---|---|
|  |  |  |  |
| 1. ............. materials. | 2. ............. materials. | 3. ............. materials. | 4. ............. materials. |

**9** **Look at the following figures, then choose the correct answer :**


Strach
Figure (A)


Iodine
Figure (B)


Strach + Iodine
Figure (C)

1. The mass of starch in figure (C) equals ................ (5 gm – 10 gm – 15 gm)
2. The mass of iodine in figure (C) equals ................ (5 gm – 10 gm – 15 gm)
3. The color of iodine in figure (C) is ................
   (the same of figure (A) – the same of figure (B) – changed into new color)
4. The produced substance in figure ................ is called compound. (A – B – C)

# LESSON FOUR

## Activity 8 Physical Changes In Our Lives

▶ **Choose the correct answer :**

Which of the following does not produce a new substance ? ..........

( Cutting some fruits and mix them together – Mixing vinegar and baking soda )

- Physical change is a type of changes that may occur to different materials around us.
- You have learned that physical change is a change in matter without any change in its structure.
- Physical changes don't form somethings new (new substances) but they can change size, shape or state of matter.

### Examples of changes in our lives

| Physical changes | Not physical changes |
|---|---|
| **Paper** | |
| Cutting a paper into small pieces. | Burning a paper forming ash. |
| **In cooking** | |
| **Making salad :** Cutting vegetables don't make them different but they have the same taste with changes in their sizes. | **Making bread :** • The baker mixes flour, water, sugar and yeast, then the baker bakes them. • The taste of the bread is not like its ingredients. |

## Give a reason for :

**Cutting a paper into small pieces is considered as a physical change.**

Because cutting a paper is a change of the shape of paper without any change in its structure.

### Notes

1. Melting wax is a physical change.



2. When some metals react with oxygen, they lose their shining and this change is not a physical change.





## Check your understanding

▶ **Put the following changes in the correct place in the table below :**

(Making fruit salad – Melting ice – Burning clothes – Cutting pieces of cloth – Losing shining of a metal)

| Physical changes | Not physical changes |
| --- | --- |
| ........................ | ........................ |
| ........................ | ........................ |
| ........................ | ........................ |
| ........................ | ........................ |

▶ **Put (✓) or (✗) :**

1. Melting of wax is not a physical change. ( )
2. Cutting a piece of paper is a chemical change while burning a paper is a physical change. ( )

 shining بريق wax شمع

# Activity 9 Chemical Changes

- In the previous activity, you have learned that there are some changes that happen to matter which are called physical changes and there are some other changes which are not physical changes. In this activity we will know that the "not physical changes" are called "**chemical changes**".

## Chemical change :

It is a change in matter with a change in its structure producing a new matter (substance).

- Chemical changes differ from physical changes, where chemical changes are not reversed easily.
- The new matter (substance) which is formed due to the chemical changes has some properties, where :
  - This new substance is different physically from the original substances such as its shape, color .... etc.
  - This new substance has different chemical properties that differ from the chemical properties of the original substances.

## Some examples of chemical changes :

**1. When iron combines (reacts) with oxygen and water, they form rust.**

* Rust is a chemical substance called **iron oxide** which is a layer with reddish color.



Rusting of a vehicle



Rusting of an iron nail

**2. When oxygen combines with carbon and hydrogen, they release heat that can start a fire.**

* The fire can change substances as wood into **ash**.



| | | | | | |
|---|---|---|---|---|---|
| formation | تكوين | original | أصلي | ash | رماد |
| reddish | محمر | layer | طبقة | | |

**3. When vinegar combines with baking soda, they form gas bubbles.**



4. Digestion of food inside your body takes place as a result of some chemical changes, where chemicals produced in your body help in the food digestion.





## Check your understanding

▶ **Complete the following sentences using the words below :**

**(rust – oxygen – chemical – water)**

1. The iron combines with ............ and ............ forming rust.
2. The changes that are not reversed easily are ............ changes.
3. When iron toys are left out in rain, ............ is formed.



| | | | |
|---|---|---|---|
| chemicals | مواد كيميائية | food digestion | هضم طعام |

## Activity 10 How Has It Changed ?

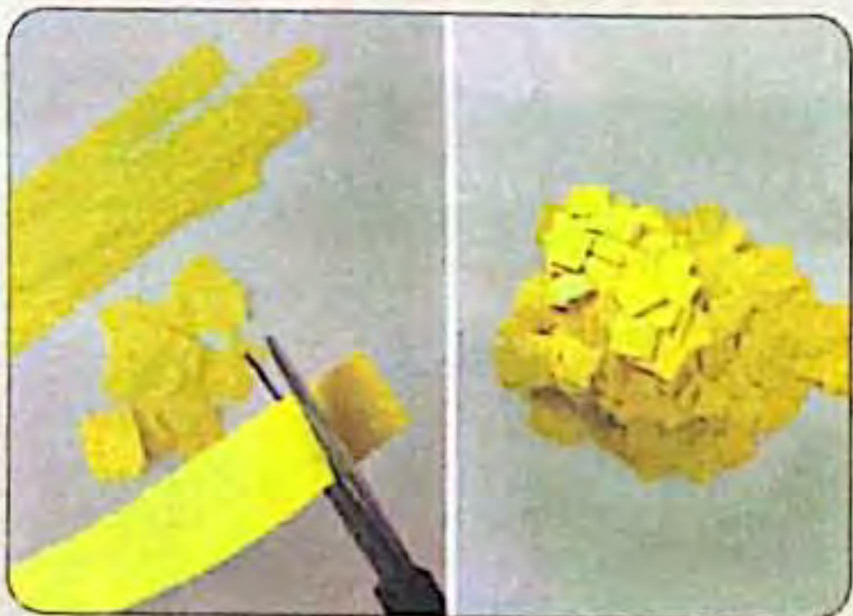
- You have learned that there are two types of changes of matter that happen around us in our daily life which are physical and chemical changes.
- The following evidence can be used to differentiate between the physical and chemical changes.

### Some evidence that describes physical changes

#### Change in shape and size

Examples :

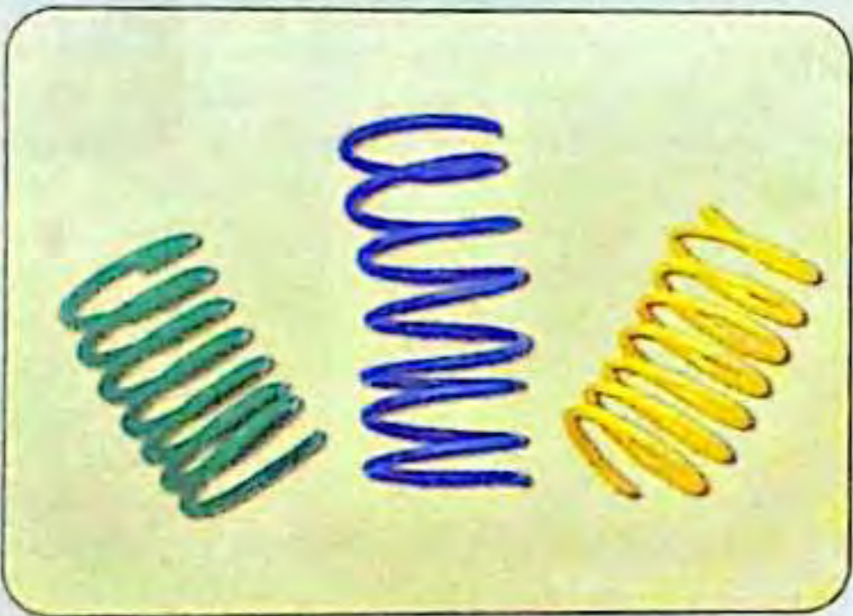
- Cutting a paper.



- Cutting a fruit.



- Coiling a straight piece of wire to form a spring.



- The flow of sand in an hourglass changes the shape of sand in the container.



#### Expected change in color

Examples :

- Adding drops of food colors to a cup of water.



- Coloring a paper.



| | | | | | |
|---|---|---|---|---|---|
| coiling | لف | straight | مستقيم | wire | سلك |
| spring | زنبرك | flow | سريان | hourglass | الساعة الرملية |
| food colors | ألوان طعام | | | | |

### Change in state of matter

Examples :

- Melting of a piece of chocolate.



- Evaporation of water.



▶ **From the previous examples, we can conclude that physical changes don't produce new substances.**

## Some evidence that describes chemical changes

### Unexpected color change

Example :

When mixing iodine with cornstarch, a new substance is formed and its color is dark blue.




### Formation of gas bubbles

Example :

When mixing baking soda with vinegar, gas bubbles appear.



### Formation of strong odor

Example :

Leaving a cup of milk out of the fridge for about two days can produce a bad smell.



▶ **From the previous examples, we can conclude that chemical changes produce new substances.**

smell رائحة



## Check your understanding

▸ **Complete the following table of changes :**

| Change | Physical or chemical change | Evidence |
|---|---|---|
| - Melting a piece of butter. | | |
| - Frying an egg. | | |
| - Painting a piece of wood. | | |
| - A bread is left in an oven for a long time that it smells like something burned. | | |

**In the Assessment Book :**
**Try to answer :**
Self-Assessment (26)

# Exercises on Lesson 4

● Understand ● Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. Iron nail will rust when it reacts with ..........
   a. carbon dioxide and water. b. carbon dioxide and vinegar.
   c. oxygen and vinegar. d. oxygen and water.

2. Burning of a paper is considered as .......... change of matter. *(Menofia 2023)*
   a. only chemical b. only physical
   c. both physical and chemical d. neither physical nor chemical

3. Among examples of physical changes is .......... *(Cairo 2023)*
   a. melting of iron. b. burning of wood.
   c. making a cake. d. digestion of food.

4. Among chemical unexpected color change is the color that is produced from mixing ..........
   a. baking soda with vinegar. b. iodine with cornstarch.
   c. food colors with water. d. salt with water.

5. From the changes that don't form a new substance is ..........
   a. burning of paper. b. cutting of wood.
   c. baking bread. d. rusting of iron.

6. Among chemical changes that occurs in cooking is ..........
   a. cutting vegetables. b. boiling of water.
   c. melting of chocolate. d. baking a bread.

7. All the following examples belong to physical changes, <u>except</u> ..........
   a. cutting a piece of paper. b. melting of ice.
   c. digestion of food. d. condensation of water vapor.

8. The change that is produced as a result of iron rusting is the same change produced from .......... *(Alex. 2023)*
   a. melting of ice. b. making bread.
   c. cutting a piece of cloth. d. breaking of glass.

9. Exposing an amount of salty water to sunlight for a long time causes ..........
   a. freezing of water. b. formation of a new substance.
   c. a chemical change to water. d. a physical change to water.

10. When oxygen combines with carbon and hydrogen, .......... energy is produced.
    a. electrical b. thermal c. kinetic d. solar

11. All the following are examples of physical changes in size, except ..........
a. cutting a paper.
b. cutting a piece of banana.
c. coloring a piece of paper.
d. cutting some vegetables.

12. Which of the following is considered as a chemical change that occurs to a piece of paper ? ..........
a. Coiling it.
b. Coloring it.
c. Cutting it into pieces.
d. Burning it.

## 2 Choose from column (B) what suits it in column (A) :

| (A) | (B) |
|---|---|
| 1. Expected change in color | a. cutting a tomato into small pieces. |
| 2. Formation of strong odor | b. adding drops of food colors to a cup of water. |
| 3. Change in size | c. mixing iodine with cornstarch. |
| 4. Unexpected change in color | d. leaving a cup of milk out of fridge for a long time. |
| | e. mixing salt with water. |

1. ............... 2. ............... 3. ............... 4. ...............

## 3 Put (✓) or (✗) :

1. When dissolving salt in water, the salt disappears forming a new substance. ( )
2. During chemical change, the properties of the matter will be changed. ( )
3. Formation of ash during burning of paper is considered as a change that forms a new substance. ( )
4. Melting of wax produces new substance. ( )
5. Cutting a piece of cloth is considered as a physical change because it produces a new substance. *(Assiut 2023)* ( )
6. Burning of wood is a chemical change. ( )
7. Rusting of iron doesn't change the structure of iron. ( )
8. We can separate baking soda from vinegar easily after mixing them together. *(Alex. 2023)* ( )
9. Their is a change in shape when you coil a piece of paper. ( )
10. When living a cup of milk out of the fridge for a long time, it will form a new substance. ( )

## 4 Complete the following sentences :

1. Cutting a paper into pieces is considered as a ................ change, while burning it is considered as a ................ change. *(Assiut 2023)*
2. The reaction between some metals and ................ gas causes loss of their shining, and this reaction is considered as a ................ change of matter.
3. The change in the structure of the original matter producing a new matter is known as ................ change.
4. Melting of wax is a ................ change, while burning of wood is a ................ change.
5. Boiling of water to form water vapor is considered as a ................ change.
6. Digestion of food forms a new ................ which has new ................
7. Changing the color of iodine and starch mixture is a ................ change, while changing the color of water and food color mixture is a ................ change.
8. Iron rusting is a ................ change, while iron painting is a ................ change. *(Giza 2023)*
9. Making yoghurt from milk is a ................ change.

## 5 Give reasons for :

1. Making bread is considered as a chemical change.

   ..............................................................................................................

2. Formation of a layer with reddish color on the surface of a wet iron wire after a period of time.

   ..............................................................................................................

3. Formation of a bad odor when milk is left out of the fridge for several days.

   ..............................................................................................................

4. Making fruit salad is considered as a physical change. *(Cairo 2023)*

   ..............................................................................................................

## 6 What happens if ...?

1. We mix iodine with cornstarch. *(Gharbia 2023)*

   ..............................................................................................................
   ..............................................................................................................

2. Oxygen, carbon and hydrogen are combining together.

   ..............................................................................................................
   ..............................................................................................................

3. You expose a shiny piece of metal to air (oxygen) for a long period of time.

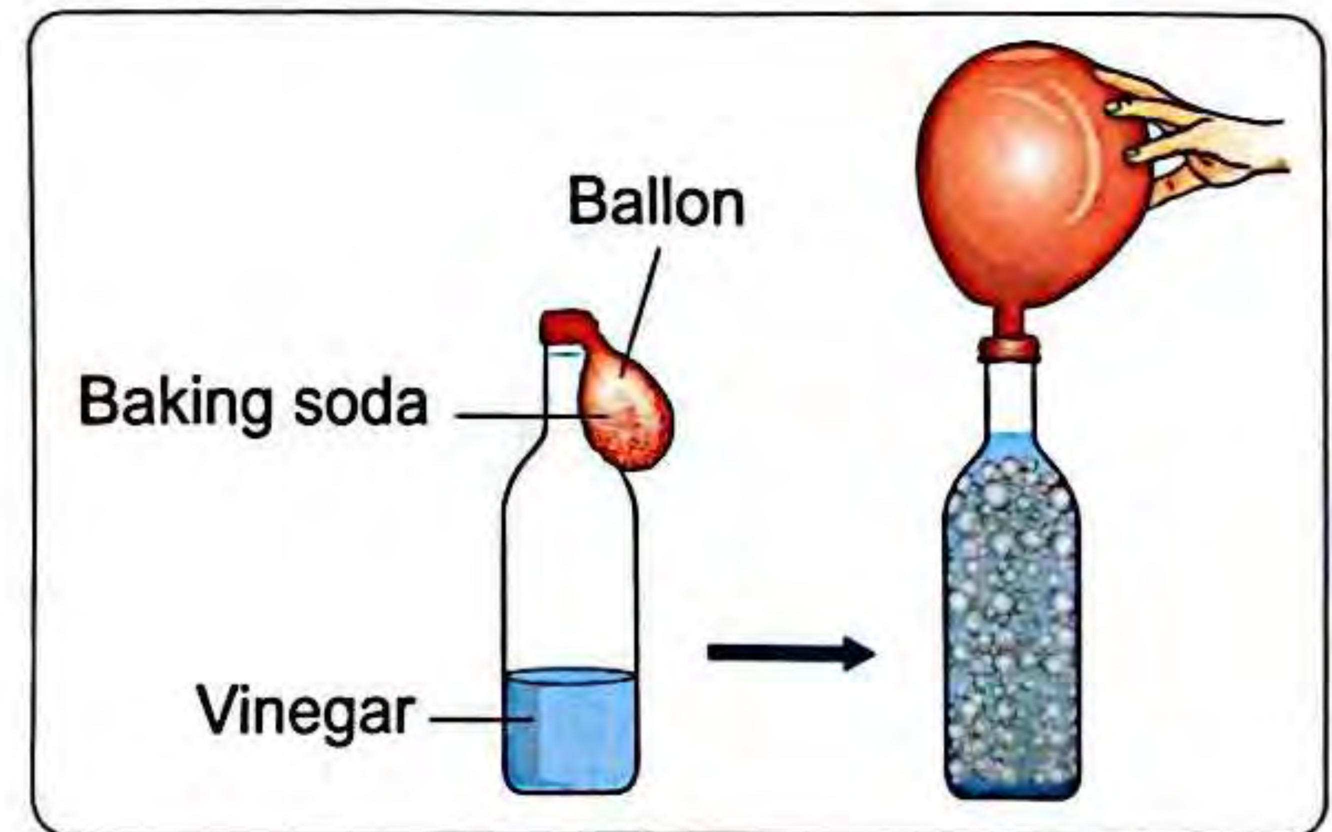
   ..............................................................................................................
   ..............................................................................................................

**7** **As shown in the diagram, the balloon inflates when the baking soda in the balloon is mixed with vinegar. What causes this to happen ?**

*(Gharbia 2023)*

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**8** **Ships body which are made of iron exposed to damage due to a type of change that you are studied.**

1. What is the type of change that takes place ?

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.......................................................................................



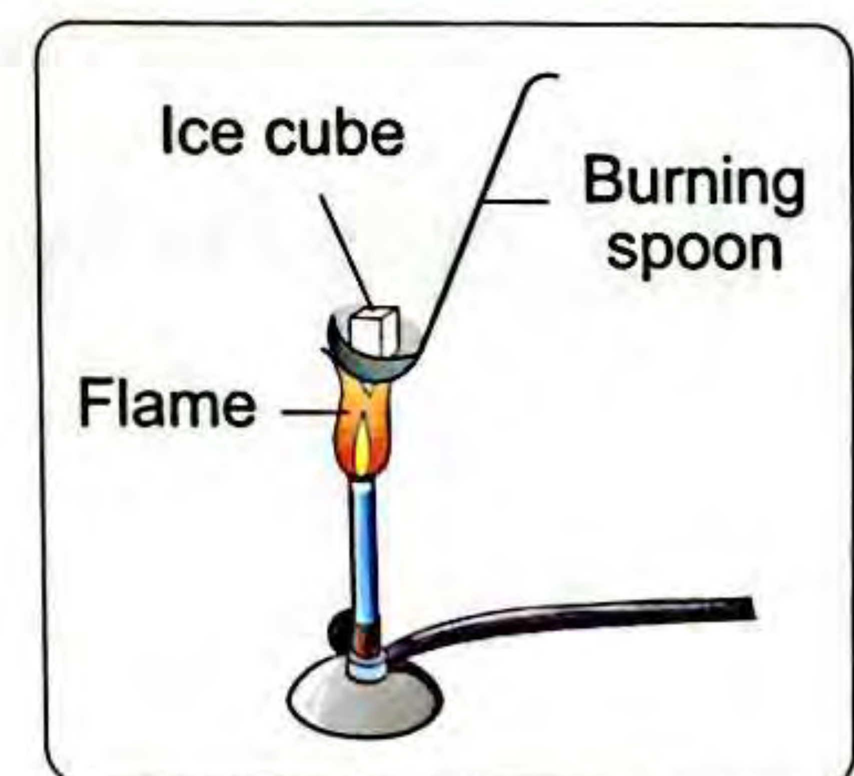
2. When iron reacts with .......... and .......... , the body of ship loses its shining as a result of iron .......... (complete)

**9** **Look at the opposite figure, then answer :**

1. What will happen to the ice cube ?

.......................................................................................

.......................................................................................




2. What is the type of change ? (Give a reason for your answer).

.......................................................................................

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## Activity 11 Record Evidence Like A Scientist

- In this concept, you have learned a lot about what happens to the matter when it is heated cooled or mixed with other substances.
- **Now,** try to think like a scientist by writing your claim, your evidence and your scientific explanation about one of the main points of this concept through the four steps you have learned in the previous concepts.

### Step 1 The Question

What happens to the mass of a substance when it is heated, cooled or mixed with other substances ?

### Step 2 My Claim

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### Step 3 My Evidence

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### Step 4 My Scientific Explanation

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| | | | |
|---|---|---|---|
| role | وظيفة / دور | evidence | دليل |
| claim | افتراض | scientific explanation | التفسير العلمي |

# Activity 12 STEM in Action

## Plenty of water, but none to drink



- Although about 70% of the surface of the Earth is covered by oceans, many people around the world cannot reach fresh water.
- This is because the water of oceans and seas is considered as a mixture of water, salt, other minerals, gases, living organisms and dead organisms, so this water is not suitable for drinking.
- But we can use desalination processes to drink the water of seas and oceans.

**Desalination :**

It is the process of removing salt from water.

### ▶ How do we separate fresh drinkable water from the mixture of ocean's water ?

We can separate the components of the oceans water as follows :

Desalination

Energy

Filter

Seawater

**(1) Filtration :**
- It removes any large materials such as seaweed, shells and fish.
- Water, salts, minerals and gases would pass through filters that make water still undrinkable.

**(2) Evaporation :**
When boiling the filtered water, water vapor rises up leaving salts and other minerals.

**(3)** By cooling the water vapor, it is turned into liquid water and it is safe to drink it

**(4)** The remained water which contains a very big amount of salt is pumped back to the oceans after desalination process.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| plenty | وفرة | reach | يحصل / يصل | fresh water | ماء عذب | seaweed | أعشاب بحرية |
| covered | مُغطى | desalination | تحلية | drinkable | قابل للشرب | shells | قواقع |

## Problems of desalination

- It requires a lot of energy.
- It is a very expensive process.
- It may lead to environmental problems such as :
  - Small marine organisms can be hurt due to sucking of water into the desalination plants.
  - The water that contains a very big amount of salt that is pumped back to oceans after desalination, can be dangerous to the marine life.



**Notes**

1. Drinking salt water makes the human body dehydrate faster which means that the human body loses water faster.
2. Egypt has over 80 desalination plants.



## Check your understanding

▶ **Put (✓) or (✗) :**

1. We use desalination process to remove salt from water. (  )
2. We can drink salt water. (  )
3. Desalination does not have any disadvantages. (  )
4. Egypt does not have any desalination plants. (  )

**Review on Concept [ 2 - 3 ]**

To review this concept look at the **Assessment Book** "Part 2 : Final Revision".

**In the Assessment Book :**

**Try to answer :**

- Self-Assessment (27)
- Model Exam on Theme (2)

| | | | | | |
|---|---|---|---|---|---|
| require | يتطلب | marine life | الحياة البحرية | pump | ضخ |
| sucking | امتصاص | hurt | يتأذى | dehydrate | يفقد الماء |

# Exercises on Lesson 5

● Understand ○ Apply ● Higher Thinking Skills

## 1 Choose the correct answer :

1. People cannot drink the water of oceans and seas because it is a mixture of water and ...........
   a. salt only. b. minerals only.
   c. living organisms only. d. salt, minerals and living organisms.
2. Desalination process means that we remove ........... from water to drink it.
   a. sugar b. salt c. oxygen gas d. hydrogen gas
   *(Cairo 2023)*
3. We can use ........... processes to separate fresh drinkable water from the water of seas and oceans.
   a. filtration and rusting b. evaporation and coloring
   c. filtration and coloring d. filtration and evaporation
4. To separate salt and minerals from seawater, we can use ........... process.
   a. evaporation b. melting c. freezing d. rusting *(Giza 2023)*
5. We can use filtration process to remove all the following from sea water, except ...........
   a. seaweed. b. salt. c. shells. d. fish.
6. All the following is from the problems of desalination, except that ...........
   a. it needs a big amount of energy.
   b. it needs a small amount of energy.
   c. it is very expensive process.
   d. it may cause many environmental problems.

---

## 2 Put (✓) or (✗) :

1. Water of oceans and seas is considered as a mixture because it consists of water, minerals and gases. ( )
2. We can use melting process to make the water of seas and oceans drinkable. ( )
3. All people around the world can reach fresh water easily. ( )
4. To get drinkable water from salty water we can use filtration process only. *(Menofia 2023)* ( )

5. Drinking salt water makes the human body dehydrate slower. ( )

6. After evaporation of seawater, the water vapor turns into liquid water by cooling. ( )

7. Among environmental problems that are caused by desalination process is that it is a very expensive process. ( )

## 3 Write the scientific term of each of the following :

1. The process of removing salt from salty water. *(Alex. 2023)* (....................)

2. The process which can be used to remove any large materials from sea and ocean water. (....................)

3. The process which can be used to separate salt and minerals from salt water of seas and oceans. *(Cairo 2023)* (....................)

## 4 Complete the following sentences using the words below :

**(salt - filtration - energy - marine - fresh - oceans - expensive - seas)**

1. Among the problems of desalination process is that it requires a lot of ................. and it is very ................. process.

2. After desalinating water, the water that is pumped back to oceans contains very large amount of ................. which can harm the ................. life.

3. We can drink ................. water, so we cannot drink the water of ................. and .................

4. We can remove seaweed, shells and fish from ocean's water by using ................. process. *(Beni Suef 2023)*

## 5 Give a reason for the following :

We cannot drink the water of oceans and seas. *(Dakahlia 2023)*

..........................................................................................................................................

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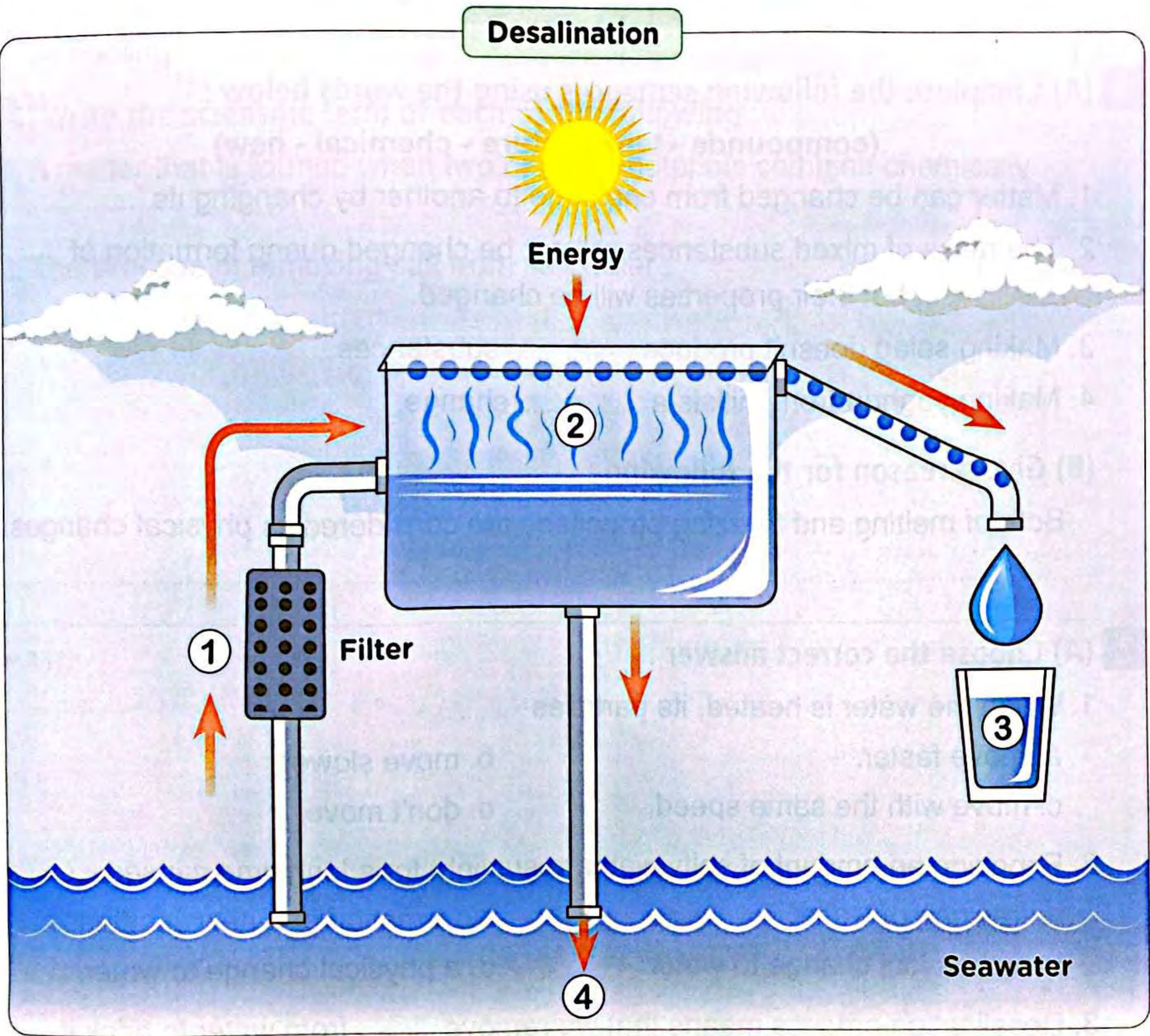
## 6 What happens if ...?

You boil an amount of seawater for a long time.

..........................................................................................................................................

..........................................................................................................................................

**7** **Look at the following figure, then choose the correct answer :**




1. The number which represents filtration process is ................. (1 - 2 - 3 - 4)
2. The number which represents the water that contains very big amount of salt and minerals is ................. (1 - 2 - 3 - 4)
3. The number which represents evaporation process is ................. (1 - 2 - 3 - 4)
4. The number which represents the drinkable water is ................. (1 - 2 - 3 - 4)

# Model Exam 1
## on Concept (2.3)

Total mark
15

**1** **(A) Complete the following sentences using the words below :** *(5 marks)*

**(compounds - temperature - chemical - new)**

1. Matter can be changed from one state to another by changing its .................
2. The mass of mixed substances will not be changed during formation of ................. , but their properties will be changed.
3. Making salad doesn't produce ................. substances.
4. Making yoghurt from milk is a ................. change.

**(B) Give a reason for the following :**

Both of melting and freezing processes are considered as physical changes.

..........................................................................................................................................

**2** **(A) Choose the correct answer :** *(5 marks)*

1. When the water is heated, its particles ..........
   a. move faster.  b. move slower.
   c. move with the same speed.  d. don't move.
2. Exposing an amount of salty water to sunlight for a long time causes ..........
   a. freezing of water.  b. formation of a new substance.
   c. a chemical change to water.  d. a physical change to water.
3. Desalination process means that we remove .......... from water to drink it.
   a. sugar  b. salt
   c. oxygen gas  d. hydrogen gas.
4. The .......... of iodine will not change after mixing it with starch.
   a. mass only  b. color only
   c. color and mass  d. properties and mass

**(B) What happens to ...?**

The mass and properties of sugar when it is mixed with an amount of flour.

..........................................................................................................................................

**3** **(A) Put (✓) or (X) :** *(5 marks)*

1. Melting and freezing are reversible processes. ( )
2. Particles of solid matter are spread out from each other. ( )

3. Melting of wax produces new substance. ( )
4. After evaporation of seawater, the water vapor is turned into liquid water by cooling. ( )

**(B) Write the scientific term of each of the following :**

1. A matter that is formed when two or more materials combine chemically. (.....................)
2. The process of removing salt from salt water . (.....................)

# Model Exam 2
## on Concept (2.3)

Total mark
______
15

**1 (A) Choose from column (B) what suits it in column (A) :** *(5 marks)*

| (A) | (B) |
|---|---|
| 1. Expected change in color.<br>2. Fromation of strong odor.<br>3. Change in shape and size.<br>4. Unexpected change in color. | a. cutting a tomato into small pieces.<br>b. adding drops of food colors to a cup of water.<br>c. mixing iodine with cornstarch.<br>d. leaving a cup of milk out of fridge for a long time.<br>e. mixing salt with water. |

1. ................ 2. ................ 3. ................ 4. ................

**(B) Give a reason for the following :**

Formation of a layer with reddish color on the surface of a wet iron wire after a period of time.

.............................................................................................................

.............................................................................................................

**2 (A) Put (✓) or (✗) :** *(5 marks)*

1. An ice cream turns into liquid by cooling. ( )
2. Water remains liquid between 0°C and 100°C. ( )
3. Evaporation and filtration processes are ways of mixtures separation. ( )
4. To get drinkable water from salty water we can use filtration process only. ( )

**(B) What happens if ... ?**

You leave an amount of salty water exposed to sunlight for several days.

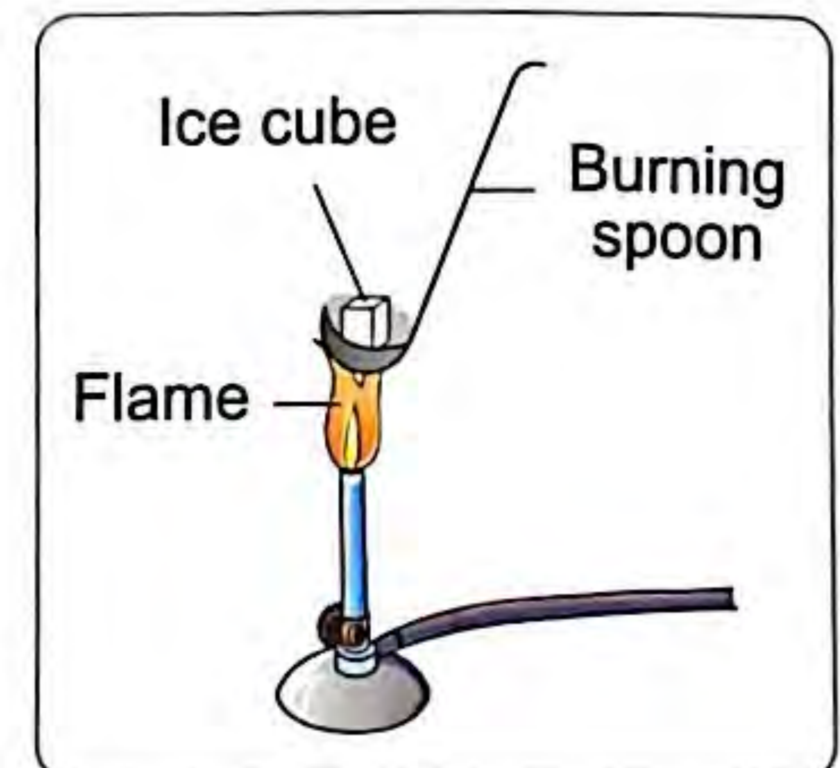
.............................................................................................................

**3 (A) Write the scientific term of each of the following :** *(5 marks)*

1. It is the process by which the particles of matter gain energy and changes from solid to liquid state. (....................)
2. It is the substance that consists of more than one matter which don't have any chemical change in their properties. (....................)

3. The process which can be used to remove any large materials from sea and ocean water. (.....................)
4. They are changes in matter which is usually reversible and don't affect its structure. (.....................)

**(B) Look at the opposite figure, then answer :**




1. What will happen to the ice cube ?

..........................................................................................................

2. What is the type of change ? (Give a reason for your answer)

..........................................................................................................




SERIES

# SCIENCE

Assessment Book

By A Group of Supervisors

5th Primary 2024

FIRST TERM

# This Assessment Book

## Includes Four Parts

**1 Part**

**Self-Assessments :** (Page 3)

**Include :**

- Cumulative self-assessments on lessons of each concept.
- Cumulative model exam on concepts.
- A model exam on each theme.



**2 Part**

**Final Revision :** (Page 47)

**Includes :**

- Review on each concept.



**3 Part**

**Final Examinations :** (Page 76)

**Include :**

- El-Moasser final examination models.
- Final examinations of some governorates.



**4 Part**

**Projects** (Page 104 )

**Include :**

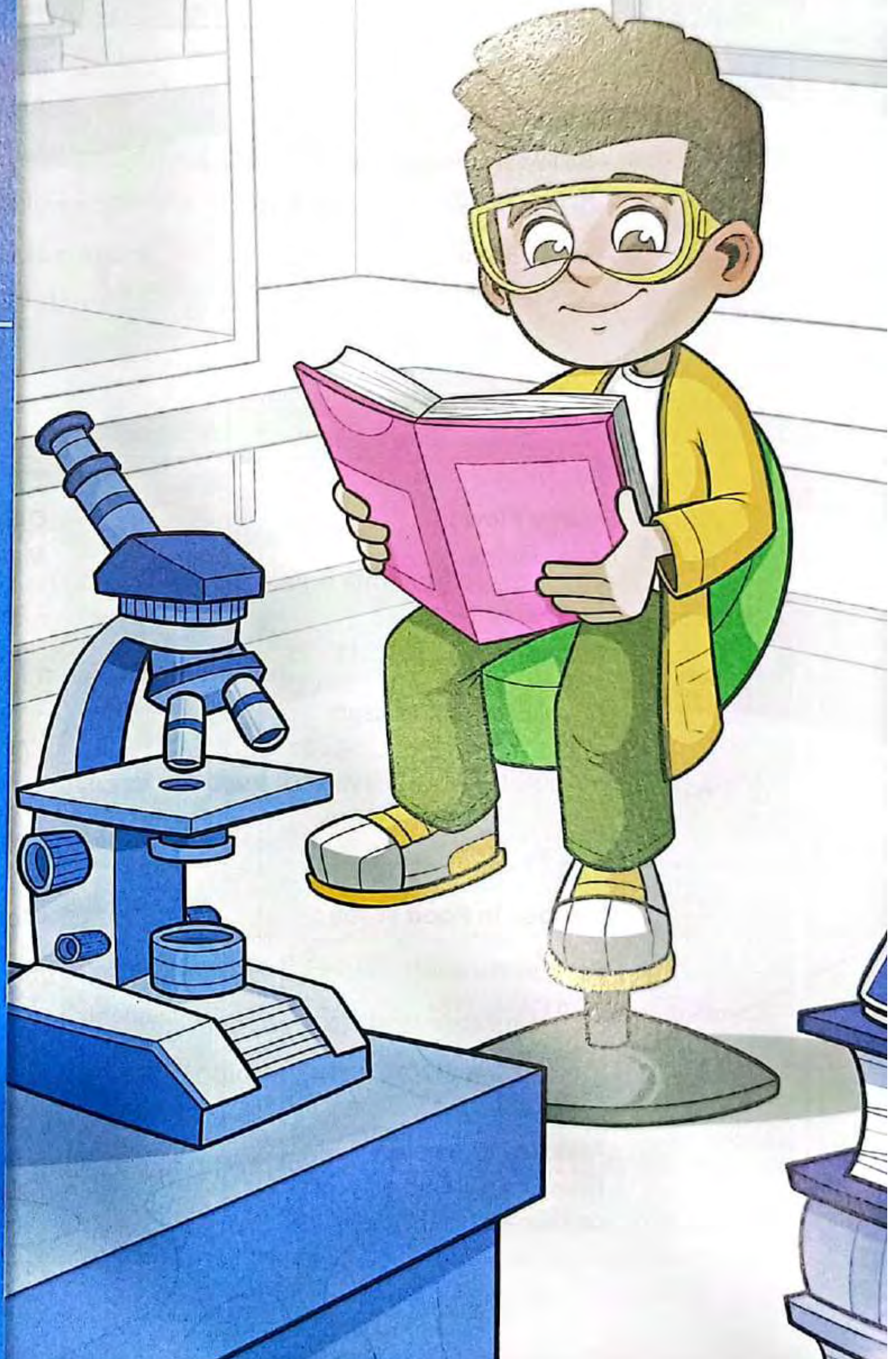
- Unit one project.
- Interdisciplinary project.
- Unit two project.



1

PART

# SELF-ASSESSMENTS



# Contents of Part One | Self-Assessments

## THEME ONE : Systems
### UNIT ONE : Interactions of Organisms



## THEME TWO : Matter and Energy
### UNIT TWO : Particles in Motion

# Self-Assessments
## on Concept (1.1)

### Self-Assessment 1 On Lesson 1

**1 (A) Choose the correct answer :**

1. The plant absorbs water from the soil through its ..............
   a. roots. b. stems. c. leaves. d. flowers.
2. The substance which is produced by the plant during photosynthesis process is ..............
   a. sunlight. b. water. c. sugar. d. carbon dioxide gas.
3. All the following substances are not important for the plant growth, except ..............
   a. rocks. b. insects. c. flowers. d. air.

**(B) Give a reason for the following :**

Without leaves, the plants can't grow or survive.

..........................................................................................................................................

..........................................................................................................................................

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**2 (A) Put (✓) or (✗) :**

1. Plant leaves absorb carbon dioxide gas from air. ( )
2. Animals, humans and plants have the same structure that help them to grow and survive. ( )
3. Each part of a plant has its own function. ( )

**(B) What happens if ...?**

We cover the green leaves of the plant to prevent sunlight from reaching them.

..........................................................................................................................................

..........................................................................................................................................

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**3 Complete the following sentences using these words :**

**(roots – stem – leaves – carbon dioxide)**

1. From the plant's structures that photosynthesis process takes place in are ............
2. The plant's ............ transfers water from the ............ of the plant to its leaves.
3. In the absence of ............ gas, the plant can't make its own food.

## Self-Assessment 2 till Lesson 2

**1 (A) Put (✓) or (X) :**

1. Seeds of beans will die if we put them on a wet paper towel and provide it with nutrients. ( )
2. Plants can live without leaves. ( )
3. Soil is important for the seeds to complete their growth. ( )

**(B) Give a reason for the following :**

Stem is an important part for the plant.

..............................................................................................................

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**2 (A) Correct the underlined words :**

1. Leaves of plants are responsible for absorption of water from the soil. (....................)
2. Oxygen gas is a basic need that the plant takes from the air to make its own food. (....................)
3. Reproduction means that the plant sprouts and begins to grow from a seed. (....................)

**(B) What happens if ...?**

We put some bean seeds in a place containing water and nutrients for some days.

..............................................................................................................

**3 Choose from column (B) what suits it in column (A) :**

| (A) | (B) |
|---|---|
| 1. Sugar | a. is not important for plants in their initial growth. |
| 2. Water | b. is the plant food that gives it the energy to grow. |
| 3. Soil | c. is the gas that the plant gets it from air. |
| | d. is from the basic needs of the plant to survive. |

1. .................... 2. .................... 3. ....................

## Self-Assessment 3 till Lesson 3

**1 (A) Correct the underlined words :**

1. Phloem in plant's leaves absorb the energy of sunlight. (....................)
2. There are tubes in the plant's root that help it to absorb more water from the soil. (....................)
3. The process through which the green parts of plants absorb sunlight to make their own food is called germination process. (....................)

**(B) What happens to ...?**

The plant's leaves when the plant is placed in a cup containing colored water.

.......................................................................................................................................

**2 (A) Complete the following sentences :**

1. The .............. of plant are responsible for absorption of water and nutrients from the soil.
2. In the presence of water, seeds can germinate at the beginning of growth without the need of ..............
3. The plant's .............. supports leaves and flowers of the plant.

**(B) Give a reason for the following :**

There are tubes called phloem inside plant's leaves.

.......................................................................................................................................

**3 Complete the following sentences using these words :**

**(yellow – green – stomata – xylem – oxygen gas)**

1. The color of leaves in pot (1) is ............, while in pot (2) is ............


Pot (1)


Pot (2)

2. Gases can move into or out of the leaves due to the presence of ............
3. During photosynthesis process, ............ will be produced from the plant.
4. Water and nutrients can reach leaves of the plant through ............

## Self-Assessment 4 till Lesson 4

### 1 (A) Choose the correct answer :

1. Gases enter plants through ..............
   a. leaves. b. stems. c. roots. d. flowers.
2. Arteries carry blood rich in .............. from the heart to all the body cells.
   a. carbon dioxide gas b. oxygen gas and glucose sugar
   c. oxygen and carbon dioxide gases
   d. carbon dioxide gas and glucose sugar
3. Flowers produce .............. for reproduction.
   a. leaves b. stems c. seeds d. roots

### (B) Give a reason for the following :

There is no life on Earth in the absence of plants.

..................................................................................................................................

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### 2 (A) Put (✓) or (✗) :

1. Plants have roots, stems, leaves and sometimes flowers or fruits. ( )
2. The heart in the human circulatory system consists of two atria and two ventricles. ( )
3. During photosynthesis process, green plants use sunlight to combine oxygen with water to make sugar. ( )

### (B) What happens if ... ?

Roots of plants don't have root hairs.

..................................................................................................................................

### 3 Complete the following sentences using these words :

**(phloem – xylem – veins – nutrients – sugar – arteries – oxygen)**

1. The vessels of ............ return the blood that carries carbon dioxide and a very small amount of ............ and oxygen from all the body parts back to the heart.
2. The tubes that carry ............ from the leaves to all plant parts are called ............
3. The tubes that carry nutrients from the roots to the leaves are called ............
4. The vessels of ............ carry blood rich in oxygen and nutrients from the heart to all the body parts.

## Self-Assessment 5 till Lesson 5

**1** **(A) Put (✓) or (✗) :**

1. Maple seeds have spines to stick to animal fur. ( )
2. The heart in the human circulatory system consists of four chambers. ( )
3. Flowers are important parts of plants that help them for reproduction. ( )

**(B) Give a reason for the following :**

Root hairs are important for plants.

........................................................................................................................................

........................................................................................................................................

**2** **(A) Write the scientific term of each of the following :**

1. The system which is responsible for transporting oxygen and nutrients throughout the body. (....................)
2. It means the transportation of seeds from one place to another. (....................)
3. The process of producing new plants. (....................)

**(B) What happens to ...?**

Plant's leaves color if the plant can't absorb water from the soil for many days.

........................................................................................................................................

........................................................................................................................................

**3** **Look at the following figures, then answer the following questions :**



Plant's seeds (1)



Plant's seed (2)

1. Plant's seeds number (1) can be dispersed by ..............., because they are ...............
2. Plant's seed number (2) can be dispersed by ...............

# Model Exam
## on Concept (1.1)

Total mark

15

**1** **(A) Complete the following sentences :** *(5 marks)*

1. Plants absorb .............. and .............. from the soil through their ..............
2. There are three types of vessels in the human circulatory system which are arteries, .............. and ..............
3. Tree trunks and shrubs have .............. stems.
4. Transport system in the plant consists of two types of vessels which are .............. and ..............

**(B) Give a reason for the following :**

Xylem in plant is a one-way vessel.

..................................................................................................................................

..................................................................................................................................

**2** **(A) Choose from column (B) what suits it in column (A) :** *(5 marks)*

| (A) | (B) |
|---|---|
| 1. Coconut seeds | a. sticking to animal fur. |
| 2. Maple seeds and dandelion seeds | b. floating on water. |
| | c. being eaten by animals. |
| 3. Burr seeds | d. traveling by wind. |
| 4. Tomato seeds and apple seeds | e. staying inside flowers without movement. |

1. ........................ 2. ........................ 3. ........................ 4. ........................

**(B) What happens if ... ?**

We remove the flowers of a plant.

..................................................................................................................................

**3** **(A) Put (✓) or (✗) :** *(5 marks)*

1. Humans, animals and plants need food and water to survive. (   )
2. All seeds need soil in its initial growth. (   )
3. There are tiny holes opening on the surface of stem that allow gases to pass through into the plant. (   )
4. Vines have climb stems. (   )

**(B) Write the scientific term of each of the following :**

1. It is found in the plant's leaves that gives them the green color and absorbs energy from the sunlight. (...................)
2. A substance that is produced from the plant during photosynthesis process and provides it with its needed energy. (...................)

# Self-Assessments
## on Concept (1.2)

### Self-Assessment 6 On Lesson 1

**1** **(A) Put (✓) or (✗) :**

1. There is no energy flow between the components of an ecosystem. ( )
2. Caracals eat mice to get their energy. ( )
3. All living organisms can do photosynthesis process. ( )

**(B) Give a reason for the following :**

Animals differ in the type of food they eat.

..........................................................................................

..........................................................................................

**2** **(A) Complete the following sentences :**

1. The energy we get from food originally comes from ...............
2. An area contains living organisms and nonliving things that interact with each other is known as ...............
3. Birds feed on worms to get their ...............

**(B) What happens to ... ?**

The body of a hawk after its death.

..........................................................................................

..........................................................................................

**3** **Look at the following two ecosystems, then choose the correct answer :**


Ecosystem (1)


Ecosystem (2)

1. The hawk can find food in ...............
   a. ecosystem (1) only.
   b. ecosystem (2) only.
   c. both ecosystems (1) and (2).
   d. neither ecosystems (1) nor (2).

2. The light energy of the Sun can pass from the plants to the predator in ..............
   a. ecosystem (2) in the absence of the prey.
   b. both ecosystems (1) and (2).
   c. ecosystem (1) only.
   d. ecosystem (2) only.
3. Photosynthesis process occurs in ...............
   a. both ecosystems (1) and (2).
   b. ecosystem (1) only.
   c. ecosystem (2) only.
   d. ecosystem (1) in the absence of water.

## Self-Assessment 7 till Lesson 2

**1** **(A) Choose the correct answer :**

1. Photosynthesis process, means ...........
   a. making glucose in the absence of light energy.
   b. making glucose in the presence of light energy.
   c. using glucose to produce energy.
   d. using salts to produce energy.
2. If a spider eats a bee that feeds on a plant, ...........
   a. both spider and bee are primary consumers.
   b. both spider and bee are secondary consumers.
   c. the bee is a secondary consumer.
   d. the spider is a secondary consumer.
3. The predator that feeds on a living organism, may be ........... for another living organism.
   a. a decomposer
   b. a producer
   c. a prey
   d. a primary consumer

**(B) Give a reason for the following :**

Producers depend on light energy of the Sun to grow.

.....................................................................................................................

.....................................................................................................................

**2** **(A) Cross out the odd word :**

1. Producers – Consumers – Nonliving things – Decomposers. (.............)
2. Sunlight – Glucose – Consumers – Photosynthesis process. (.............)
3. Fungi – Snakes – Millipedes – Bacteria. (.............)

**(B) Study the following food chain, then complete the sentences below :**

Plant → Grasshopper → Bird → Snake → Hawk

1. The .......... is a producer, because ..........
2. The .......... is a secondary consumer, because ..........

**3 Complete the following table using the words between brackets :**

**(decomposition – photosynthesis – living organisms)**

| Producers | Consumers | Decomposers |
|---|---|---|
| They can make their own food by .......... process. | They are organisms that eat other .......... to get their energy. | They recycle nutrients back into the ecosystem through the process of .......... of dead organisms. |

## Self-Assessment 8 till Lesson 3

**1 (A) Choose the correct answer :**

1. The model that shows many interactions between different types of living organisms is known as ..........
   a. food chain. b. food web. c. ecosystem. d. habitat.
2. All the following are basic needs for human to survive, except ..........
   a. water. b. food. c. oxygen. d. electricity.
3. All the following are producers, except ..........
   a. grasses. b. trees. c. bacteria. d. algae.

**(B) Give a reason for the following :**

In a food chain, a bird is not considered as a secondary consumer if it eats plants.

..........................................................................................

..........................................................................................

**2 (A) Cross out the odd word :**

1. Snakes – Hawks – Rabbits – Alligators. (..............)
2. Fungi – Bacteria – Plants – Millipedes. (..............)
3. Bacteria – Rabbit – Sheep – Goat. (..............)

(B) Use the following living organisms to form two food chains that contain only one predator :

**(Deer – Lion – Grasses – Alligator)**

..............................................................................................................................

**3** Study the following three groups of living organisms, then choose the correct answer :

| Group (A) | Group (B) | Group (C) |
|---|---|---|
| – Grasses<br>– Grapes<br>– Carrots<br>– Potato<br>– Tomato | – Cows<br>– Ducks<br>– Chickens<br>– Rabbits<br>– Fish | – Grasses<br>– Foxes<br>– Hawks<br>– Rabbits<br>– Fish |

1. Producers and consumers are found together in ..........
   a. Group (A) only. b. Group (B) only.
   c. Group (A) or group (B). d. Group (C) only.
2. Group (B) shows ..........
   a. producers and decomposers. b. consumer and decomposers.
   c. primary consumers. d. secondary consumers.
3. Energy can flow in a food chain, between animals of ..........
   a. group (B) only. b. group (C) only.
   c. group (A) only. d. group (B) or group (A).
4. Decomposers ..........
   a. are present in group (A). b. are present in group (B).
   c. are present in group (C). d. are not present in any group.

## Self-Assessment 9 till Lesson 4

**1** (A) Put (✓) or (✗) :

1. Plant-community ecologists can restore habitats for plants which are important for all other living organisms. ( )
2. Producers can make their own food in the form of glucose sugar which is rich with energy. ( )
3. Sticky seeds need water to be dispersed. ( )

### (B) Give a reason for the following :

Light seeds are dispersed by wind.

.....................................................................................................................

.....................................................................................................................

### 2 (A) Choose the correct answer :

1. Plant-community ecologists do their studies and researches on ..........
   - a. plants only.
   - b. animals only.
   - c. plants and animals.
   - d. producers and consumers.
2. If a plant doesn't disperse its seeds, so this plant population will ..........
   - a. increase.
   - b. decrease.
   - c. not be affected.
   - d. be positively affected.
3. All plants disperse their seeds ..........
   - a. through wind only.
   - b. by sticking to animals bodies only.
   - c. in many different ways.
   - d. through water only.

### (B) What happens if ...?

Ecologists don't restore a damaged ecosystem.

.....................................................................................................................

.....................................................................................................................

### 3 Study the following three figures that represent animals as squares where the bigger one can eat the smaller one, then choose which figure can express a food chain :

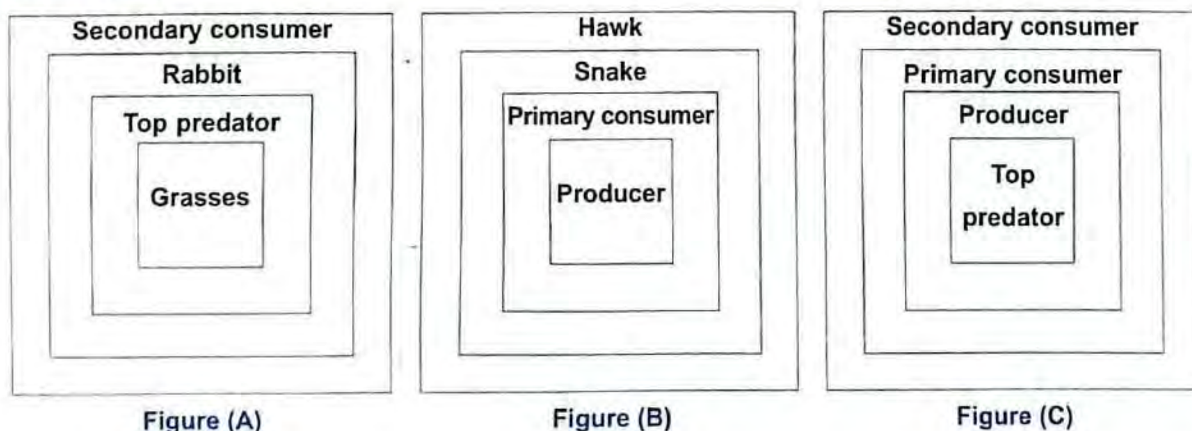



Figure (A) Figure (B) Figure (C)

# Model Exam

## on Concepts (1.1) & (1.2)

Total mark

15

**1** **(A) Choose the correct answer :** *(5 marks)*

1. Winds play an important role in dispersing .......... seeds.
   a. floating  b. sticky  c. big heavy  d. small light
2. .......... system in plants consists of tubes that water and nutrients move through it.
   a. Digestive  b. Respiratory  c. Transport  d. Nervous
3. Any food chain starts with ..........
   a. insects.  b. fungi.  c. plants.  d. bacteria.
4. The kind of stems that extend underground are called .......... stems.
   a. climb  b. tuber  c. runner  d. wood

**(B) What happens if ...?**

All the primary consumers disappear from a certain food chain.

.................................................................................................................

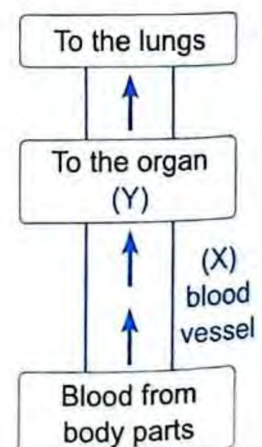
.................................................................................................................

**2** **(A) Put (✓) or (✗) :** *(5 marks)*

1. Photosynthesis process takes place in the plant's roots. (  )
2. The food web describes energy flow and feeding interactions between living organisms in an ecosystem. (  )
3. At the beginning of germinating some bean seeds, they can grow without soil or water. (  )
4. Birds eat insects as preys to get their energy. (  )

**(B) The figure to the right represents a blood vessel, which answer represents (X) & (Y) :**

| | (X) | (Y) |
|---|---|---|
| a | Artery | The heart |
| b | Vein | The brain |
| c | Vein | The heart |
| d | Artery | The lungs |



**3 (A) Write the scientific term of each of the following :** *(5 marks)*

1. The gas that is present in air and necessary for the formation of plant food. (..................)
2. Small structures in the plant's roots that increase the absorption of water and nutrients from the soil. (..................)
3. A group of living organisms that can live on decaying dead organisms. (..................)
4. Parts of the plant that are responsible for reproduction. (..................)

**(B) Study the following food web, then choose the correct answer :**




1. When .......... disappear from this food web, birds will move away to search for food in another ecosystem.
   a. butterflies only
   b. worms only
   c. grasshoppers only
   d. primary consumers
2. Grasshoppers may die, when there is no ..........
   a. birds.
   b. snakes.
   c. plants.
   d. butterflies.

# Self-Assessments
## on Concept (1.3)

### Self-Assessment 10 On Lesson 1

**1** **(A) Cross out the odd word :**

1. Grasses – Algae – Sea stars – Trees. (....................)
2. Clam – Zooplankton – Algae – Sea urchin. (....................)
3. Sharks – Crocodiles – Snakes – Hawks. (....................)

**(B) Give a reason for the following :**

All food chains depend on sunlight.

..........................................................................................................................................

**2** **(A) Choose the correct answer :**

1. All marine food chains don't include ...............
   a. algae. b. zooplankton.
   c. tigers. d. sharks.
2. Flooding which may destroy a desert ecosystem, is due to ...............
   a. drought condition. b. decreasing producers.
   c. gentle rain. d. heavy rain.
3. If algae are completely removed from a marine ecosystem, ............... will be negatively affected.
   a. clam only b. zooplankton only
   c. clam and zooplankton d. clam, zooplankton and sea urchin

**(B) Study the following food chain, then complete the table below :**

**Algae → Clam → Sea star → Shark**

| The living organism | Its type |
|---|---|
| 1. Algae | ............... |
| 2. ............... | Primary consumer. |
| 3. Sea star | ............... |
| 4. Shark | ............... |

**3** **Form a food chain on land environment from the following living organisms :**

**(Deer – Shark – Grasses – Lion)**

..............................................................................................................

## Self-Assessment 11 till Lesson 2

**1** **(A) Cross out the odd word :**

1. Primary consumers – Decomposers – Secondary consumers – Top predators. (.....................)
2. Fox – Clam – Rabbit – Eagle. (.....................)
3. Seabird – Small fish – Tiger – Microorganisms. (.....................)

**(B) Give a reason for the following :**

Predators cannot feed directly on plants.

..............................................................................................................

**2** **(A) Correct the underlined words :**

1. Energy transfers when a <u>secondary consumer</u> feed on a producer. (.....................)
2. All <u>nonliving things</u> can make their own food. (.....................)
3. Producers need the energy of <u>moonlight</u> to make photosynthesis process. (.....................)

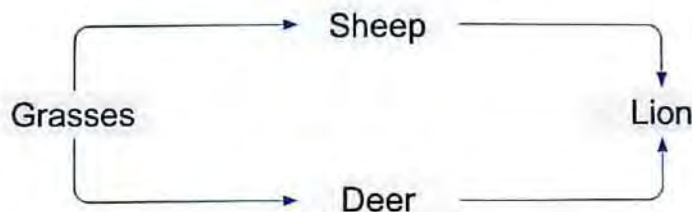
**(B) What happens to ...?**

The food resources of the seabirds when the seawater becomes cooler.

..............................................................................................................

..............................................................................................................

**3** **Study the following food web, then put (✓) or (✗) :**




1. Energy can transfer from the producer to the deer only. (   )
2. Both sheep and deer are primary consumers. (   )
3. Grasses are considered as producers because they cannot make their own food. (   )
4. The lion is considered as a secondary consumer and a top predator. (   )

## Self-Assessment 12 till Lesson 3

**1 (A) Complete the following sentences using the words below :**

**(producers – coral bleaching – plastic)**

1. In .............. , the color of coral reefs turns completely into white.
2. Marine living organisms cannot differentiate between real food and .............. waste materials.
3. In marine food chains, microorganisms are considered as ..............

**(B) What happens to ... ?**

The coral reefs when the seawater temperature rises.

..........................................................................................................................................

**2 (A) Correct the underlined words :**

1. Plastics are healthy and smooth , so they cause harm to marine living organisms.
2. Due to rising of seawater temperature, coral reefs turn completely into green.
3. Marine living organisms cannot differentiate between water and plastics.

**(B) Give a reason for the following :**

It is better to recycle plastic waste materials than throwing them in water.

..........................................................................................................................................

..........................................................................................................................................

**3 Choose from the following living organisms to form a food chain in seawater :**

**(Zooplankton – Shark – Algae – Tiger – Corals – parrotfish)**

..........................................................................................................................................

## Self-Assessment 13 till Lesson 4

**1 (A) Put (✓) or (✗) :**

1. Removing plants at riverbanks, negatively impact the environment. ( )
2. Habitat restoration projects, include repairing all natural resources of an ecosystem. ( )
3. Riverbanks eroding may occur due to removing primary consumers away from an ecosystem. ( )

### (B) What happens to ...?

An animal species if its habitat will not be restored to the natural state.

..............................................................................................................................

## 2 (A) Choose from column (B) what suits it in column (A) :

| (A) | (B) |
|---|---|
| 1. Corals | a. depend on grasses to get energy. |
| 2. Seabirds | b. depend on deers to get energy. |
| 3. Rabbits | c. depend on microorganisms indirectly to get energy. |
| | d. depend on algae indirectly to get energy. |

1. ..................... 2. ..................... 3. .....................

### (B) Give a reason for the following :

Removing plants at riverbanks harms an ecosystem in many different ways.

..............................................................................................................................

..............................................................................................................................

## 3 Correct the underlined words :

1. Microplastics is a new way that people in Egypt coastal communities apply to decrease using of one-use plastic products. (...................)
2. Habitat loss is the process of returning a habitat back to its natural state before harm was done. (...................)
3. The place in which we can take care of coral until they grow up, is known as hospital. (...................)

# Model Exam
## on Theme (1)

Total mark

15

**1** (A) Choose the correct answer : *(5 marks)*

1. The roots of a plant absorb .......... from the soil to help it grow.
   a. oxygen gas
   b. carbon dioxide gas
   c. sugar
   d. water
2. The marine food web usually starts with ..........
   a. clam.
   b. algae.
   c. zooplankton.
   d. parrotfish.
3. A hawk can eat .......... , when snakes completely disappear from an ecosystem.
   a. leaves
   b. birds
   c. grasses
   d. grasshoppers
4. Which of the following substances are produced by the plant during photosynthesis process ? ..........
   a. Glucose and oxygen.
   b. Carbon dioxide and water.
   c. Glucose and carbon dioxide.
   d. Glucose and water.

(B) Give a reason for the following :

Sunlight is important for all living organisms.

....................................................................................................

....................................................................................................

**2** (A) Write the scientific term of each of the following : *(5 marks)*

1. A type of living organisms that can produce their own food by absorbing sunlight. (....................)
2. It is found in plant's leaves that gives them green color and absorbs energy from the sunlight. (....................)
3. A group of living organisms that can live on decaying dead organisms. (....................)
4. It is the number of organisms of one type of species live in an area. (....................)

(B) What happens to ... ?

The food resources of the small fish when the seawater becomes warm.

....................................................................................................

....................................................................................................

**3** (A) Complete the following sentences : *(5 marks)*

1. If producers increase in an ecosystem, the primary .......... will increase.
2. Maple seeds and dandelion seeds can travel by ..........
3. Predators living organisms may be .......... for other living organisms.
4. The consumers that exist at the top of any food chain are called ..........

(B) Rearrange the following living organisms to form a food chain :

| Small fish | Seabirds | Microorganisms |
|---|---|---|

# Assess Your Learning

## Questions of the Shool Book on Theme (1)

### 1 Choose the correct answer :

1. .......... is the main source of energy for all living organisms.
   a. Food  b. Water  c. The Sun  d. The moon
2. .......... absorb the sunlight that the plant needs to make food.
   a. Roots  b. Leaves  c. Xylem vessels  d. Stems
3. All of the following are considered producer organisms, except ..........
   a. grass.  b. hawk.  c. algae.  d. trees.
4. .......... can make their own food.
   a. Plants  b. Humans
   c. Animals  d. Plants and some animals
5. .......... return the blood that contains carbon dioxide back to the heart.
   a. Lungs  b. Phloem vessels  c. Arteries  d. Veins
6. The increase of pollution in an ecosystem will cause .......... in the number of species of living organisms.
   a. increase  b. decrease  c. equality  d. no change

### 2 Compare each of the following :

1. What happens to the plant in the light and in the dark ?
   ..............................................................................................................
2. Transport in plant and human.
   ..............................................................................................................
3. The producer organisms and the consumer organisms.
   ..............................................................................................................

### 3 Put (✓) or (✗) :

1. In plants, light energy is converted into chemical energy. (   )
2. Vascular systems differ in plants and humans and they do not play the same role. (   )
3. All living organisms depend on each other for getting energy. (   )
4. An ecosystem consists of living organisms only. (   )

5. A food web is a group of interconnected food chains that shows many food relationships. ( )
6. Human activities in the environment affect the living organisms only. ( )

**4** **Rewrite the sentence after correcting the underlined word :**

1. Consumer organisms help decompose the remains of dead plants and animals into nutrients that can be returned to the ecosystem.

..................................................................................................................

2. Increasing of water temperatures cause coral reefs turn into green.

..................................................................................................................

3. Producer organisms need moon light to perform photosynthesis.

..................................................................................................................

**Answer the following :**

**5** **In front of you a group of organisms, observe them, then answer the following questions :**





1. Add three other living organisms, then form a food web from all of them.

..................................................................................................................

..................................................................................................................

..................................................................................................................

2. Explain the type of each living organism in this food web.

..................................................................................................................

..................................................................................................................

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# Self-Assessments

## on Concept (2.1)

## Self-Assessment 14 On Lesson 1

**1** **(A) Correct the underlined words :**

1. Sand is an example of liquid matter. (......................)
2. Ice is water in the gas state. (......................)
3. Water vapor is considered as an example of solid matter. (......................)

**(B) What happens to ...?**

The state of water when it is heated to a very high temperature.

..............................................................................................................................

**2** **(A) Put (✓) or (✗) :**

1. A mass of matter is the space occupied by this matter. (   )
2. Any matter consists of tiny things that we cannot see with our eyes. (   )
3. A matter has two states. (   )

**(B) Give a reason for the following :**

Oil is a matter.

..............................................................................................................................

**3** **Classify the following words into solids, liquids and gases in the table below :**

**(Milk – Carbon dioxide – Sugar – Stone – Blood – Oxygen – Oil – Coal – Water vapor)**

| Solids | Liquids | Gases |
|---|---|---|
| .................................... | .................................... | .................................... |
| .................................... | .................................... | .................................... |
| .................................... | .................................... | .................................... |

## Self-Assessment 15 till Lesson 2

**1** **(A) Cross out the odd word :**

1. Air – Oxygen – Glass – Carbon dioxide. (......................)
2. Wood – Plastic – Glass – Air. (......................)
3. Oil – Milk – Water – Coin. (......................)

**(B) Give a reason for the following :**

Gasoline is a liquid matter.

.................................................................................................................................

**2 (A) Correct the underlined words :**

1. Particles of solid matter have a lot of spaces. (.......................)
2. Matter is anything that has color and volume. (.......................)
3. We can measure the mass of some matter using thermometer. (.......................)

**(B) What happens to ...?**

The shape of ice if it changes into water.

.................................................................................................................................

**3 Arrange the following pictures that show the three states of water according to :**



(A)



(B)



(C)

1. Spaces between particles (Ascendingly).

.................................................................................................................................

2. Energy of particles (Descendingly).

.................................................................................................................................

## Self-Assessment 16 till Lesson 3

**1 (A) Correct the underlined words :**

1. A matter consists of tiny states. (.......................)
2. To see some particles of a matter, we have to use a measuring tape. (.......................)
3. Particles of liquids are packed tightly. (.......................)

**(B) Give a reason for the following :**

Normal microscope was invented.

.................................................................................................................................

## 2 (A) Complete the following sentences :

1. Particles of ................ matter can slide over each other, so they take the shape of their containers.
2. Particles of ................ matter can move very quickly in all directions.
3. Both shape and volume of a coin is ................ as it is a solid substance.

### (B) What happens to ... ?

The particles of air inside the balloon when you squeeze it.

..........................................................................................................................

..........................................................................................................................

## 3 Choose from columns (B) & (C) what suit them in column (A) :

| (A) | (B) | (C) |
|---|---|---|
| 1. Glass | a. has no definite shape or volume. | A. Its particles have no energy. |
| 2. Water | b. has no definite volume and definite shape. | B. Its particles have low energy. |
| 3. Air | c. has no definite shape and definite volume. | C. Its particles have medium energy. |
| | d. has definite shape and volume. | D. Its particles have high energy. |

1. ........... → ...........  2. ........... → ...........  3. ........... → ...........

## Self-Assessment 17 till Lesson 4

## 1 (A) Put (✓) or (✗) :

1. Models can help us see things that are too small or too big to observe. (   )
2. A group of students standing very closely together in a small area, this group may represent a model of a gas matter. (   )
3. The mass of an iron cube is the amount of space that it takes up. (   )

### (B) Give a reason for the following :

A golden ring is considered a matter.

..........................................................................................................................

**2** (A) Correct the underlined words :

1. Particles of liquids are arranged in a regular pattern. (........................)
2. Light is a form of matter. (........................)
3. A model is a copy that is different from a real thing. (........................)

(B) What happens if ...?

Water is placed in some containers that have different shapes.

..........................................................................................................................................

**3** Classify the following materials according to the arrangement of particles into regular pattern or random arrangement in the table below :

**(wood – water – plastic – oxygen – oil – carbon dioxide)**

| Regular pattern | Random arrangement |
|---|---|
| .................................................... | .................................................... |
| .................................................... | .................................................... |
| .................................................... | .................................................... |
| .................................................... | .................................................... |

## Self-Assessment 18 till Lesson 5

**1** (A) Put (✓) or (✗) :

1. A rock is a matter as it has mass and volume. (   )
2. Models are designed to let things be studied more hard. (   )
3. Particles of a ruler are packed very close to each other. (   )

(B) Give a reason for the following :

Water vapor has no definite shape or volume.

..........................................................................................................................................

**2** (A) Correct the underlined words :

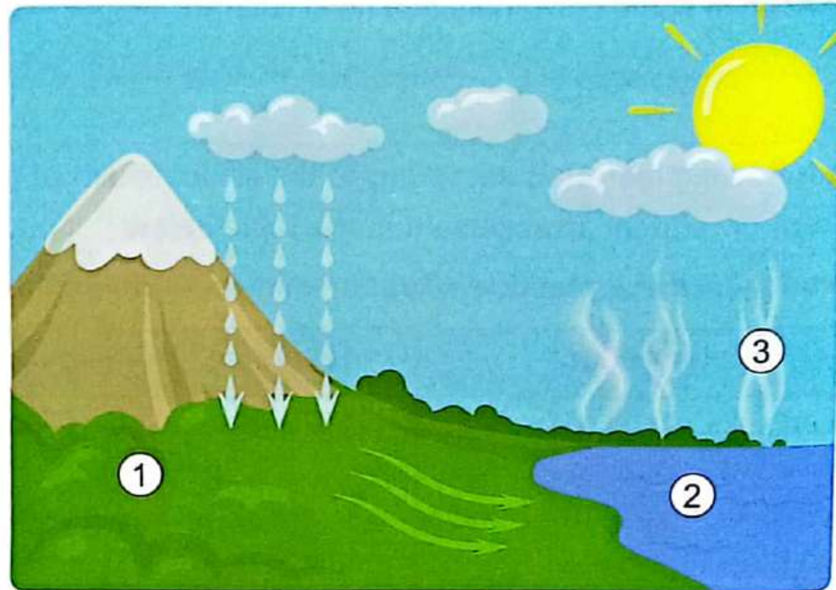
1. The amount of space occupied by a substance is related to its mass. (........................)
2. The shape of liquids doesn't change whatever the container they are put in. (........................)
3. Particles of gases have a regular pattern. (........................)

### (B) What happens to ...?

The speed of particles of water when it is heated.

..................................................................................................................................................................

### 3 Look at the following picture that shows the water cycle in nature, then complete the following sentences :




1. Label (1) refers to a matter in .............. state.
2. Label (2) refers to a matter in .............. state.
3. Label (3) refers to a matter in .............. state.

# Model Exam
## on Concepts (2.1)

Total mark
/15

**1** **(A) Complete the following sentences :** *(5 marks)*

1. Matter is made up of tiny ..............
2. Earth is a planet in the .............. system.
3. To describe the particles of a matter in .............. state by modeling balls, we should put the balls packed together.
4. Particles of .............. matter can slide over each other.

**(B) Give a reason for the following :**

Salt is a solid matter.

........................................................................................................................................

**2** **(A) Choose the correct answer :** *(5 marks)*

1. All of these substances are liquids, except ..................
   a. oil. b. milk. c. stone. d. vinegar.
2. Gases have .................. shape and .................. volume.
   a. definite – definite b. no definite – no definite
   c. definite – no definite d. no definite – definite
3. The movement of particles of water are slower than that of ..................
   a. wood. b. plastic. c. air. d. gold.
4. We can use a model to study very large things such as ..................
   a. solar system. b. germs. c. microbes. d. viruses.

**(B) What happens to ...?**

The arrangement of particles of water after its freezing.

........................................................................................................................................

**3** **(A) Put (✓) or (✗) :** *(5 marks)*

1. Gasoline takes the shape of its container. ( )
2. All matter have only one state. ( )
3. Particles of water can move more freely than the particles of water vapor. ( )
4. Particles of an aluminium spoon are similar to particles of a golden ring. ( )

**(B) Cross out the odd word :**

1. Coal – Carbon dioxide – Oxygen – Air. (......................)
2. Oil – Milk – Water – Wood. (......................)

# Self-Assessments
## on Concept (2.2)

### Self-Assessment 19 On Lesson 1

**1** (A) Complete the following sentences using the words below :

**(climate – slanted – thermometer)**

1. The roof of tropical rainforest home is ............ and made of leaves and sticks.
2. The material that is used in making roofs of desert homes and cold weather homes are different due to the difference in ............
3. When we have to know the temperature of boiling water, we can use the ............

(B) Give a reason for the following :

Rains can't enter homes of cold weather regions.

..........................................................................................................................

**2** (A) Put (✓) or (✗) :

1. Balance can be used to measure the length of your friend. (   )
2. Strong stones protect the roofs of desert homes from dust and dirt. (   )
3. We may need to measure more than one property to identify an unknown matter. (   )

(B) Mention the tool that is used in measuring the following properties :

1. The mass of some oranges. (......................)
2. The volume of an amount of juice. (......................)

**3** Look at the following picture, then complete the following sentences :


Home (1)


Home (2)


Home (3)

1. Ceramic tiles are used in making the roof of home (.................) to protect it from .................
2. Strong stones are used in making the roof of home (.................) to protect it from ................. and .................
3. Leaves and sticks are used in making the roof of home (.................) to protect it from .................

# Self-Assessment 20 till Lesson 2

**1 (A) Choose the correct answer :**

1. You can differentiate between flour and sugar through their ....................
   a. color only. b. taste only.
   c. color and odor. d. taste and odor.
2. Which of the following homes has a flat roof ? ....................
   a. Desert homes only.
   b. Cold weather homes only.
   c. Desert homes and tropical rainforest homes.
   d. Desert homes and cold weather homes.
3. You can use the thermometer to measure the .................... of objects.
   a. mass b. length
   c. volume d. temperature

**(B) Give a reason for the following :**

You cannot differentiate between salt and sugar by your eyes only.

..........................................................................................................................................

..........................................................................................................................................

**2 (A) Correct the underlined words :**

1. The mass of fruits is measured by using a measuring cup. (........................)
2. Roofs of desert homes are slanted to protect them from rains. (........................)
3. You can use the lens to identify the taste of sugar crystals. (........................)

**(B) Mention two different senses that you can use to differentiate between salt and flour.**

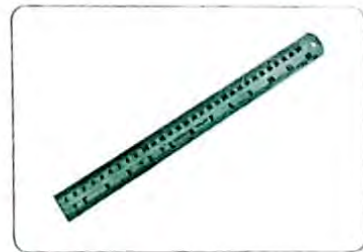
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**3 Look at the following figures, then complete the following sentences :**


Tool (A)


Tool (B)


Tool (C)

1. You can use tool .................. to measure the volume of an amount of water.
2. You can use tool .................. to measure the mass of some vegetables.
3. You can use tool .................. to measure the length of your pencil.

## Self-Assessment 21 till Lesson 3

**1** **(A) Choose from column (B) what suits it in column (A) :**

| (A) | (B) |
|---|---|
| 1. Iron nail | a. sinks in water and doesn't attract to the magnet. |
| 2. Piece of stone | b. floats on water and attracted to the magnet. |
| 3. Piece of wood | c. sinks in water and attracted to the magnet. |
| | d. floats on water and doesn't attract to the magnet. |

1. .................... 2. .................... 3. ....................

**(B) Give a reason for the following :**

When we cut a piece from an apple, the mass of the whole apple will change.

..........................................................................................................

**2** **(A) Put (✓) or (✗) :**

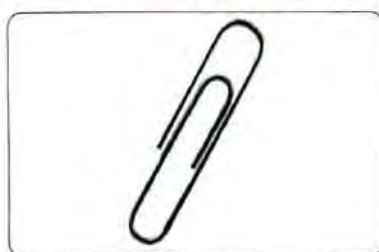
1. The attraction of different materials to the magnet is from the chemical properties of matter. ( )
2. The length of a wood bar can be measured by a ruler. ( )
3. Ceramic tiles protect desert home roofs from dust and dirt. ( )

**(B) What happens if ... ?**

We put a piece of plastic close to a magnet.

..........................................................................................................

**3** **Look at the following pictures, then choose the correct answer :**



A paper clip
material (A)



A wooden cube
material (B)

1. If we put the two previous materials in water, which material sinks ? ..................
(material (A) – material (B))
2. If a magnet is put close to the two materials, which material doesn't attract to the magnet ? .................. (material (A) – material (B))
3. We can measure the mass of each material by using a ..................
(ruler – balance)

## Self-Assessment 22 till Lesson 4

### 1 (A) Choose the correct answer :

1. The used materials in making cooking pans are ..................
   a. copper and glass. b. copper and helium.
   c. glass and helium. d. copper and wood.
2. Both .................. are sinking in water and attracted to the magnet.
   a. stone and iron nail b. paper clip and iron nail
   c. paper clip and wood spoon d. plastic ruler and wood spoon
3. 1 kilogram of iron = 1 kilogram of cotton. This sentence means that both materials are equal in ..................
   a. mass only. b. volume only.
   c. volume and mass. d. mass and temperature.

### (B) Give a reason for the following :

Glass is used in making eyeglasses.

.......................................................................................................................................

### 2 (A) Cross out the odd word :

1. Shape – Mass – Rusting – Color. (......................)
2. Kilogram – Liter – Cubic centimeter – Milliliter. (......................)
3. Piece of wood – Iron nail – Piece of cork – Piece of stone. (......................)

### (B) What happens if ...?

You put a piece of cork in a beaker filled with water.

.......................................................................................................................................

### 3 Look at the following pictures, then complete the following sentences :


Object (A)


Object (B)


Object (C)

1. Object (................) is made of steel, because it is ................ and ................
2. Object (................) is made of rubber, because it is ................ and ................
3. Object (................) is made of glass, because it is ................ and ................

# Model Exam

## on Concepts (2.1) & (2.2)

Total mark

—
15

**1** **(A) Complete the following sentences using the words below :** *(5 marks)*

**(rubber – increases – microscope – mass)**

1. When an ice cube is exposed to the Sun, the speed of movement of its particles ..............
2. The .............. of your school bag can be determined by a balance.
3. A model of a germ helps us to see its shape without using a .............. which is used to magnify tiny objects.
4. As .............. is a waterproof material, we can use it in making gloves.

**(B) Give a reason for the following :**

Rusting of iron is considered from the chemical properties of matter.

..............................................................................................................................

**2** **(A) Put (✓) or (✗) :** *(5 marks)*

1. If we put a wooden cube in water, it will float. (   )
2. Color of milk is considered as one of its chemical properties. (   )
3. Air particles are visible as they are very large particles. (   )
4. Particles of wood are different from particles of plastic. (   )

**(B) What happens to ... ?**

The shape of water when it changes into ice.

..............................................................................................................................

**3** **(A) Choose the correct answer :** *(5 marks)*

1. When water becomes ice, this means that it changes from .................... state to .................... state.

   a. solid – liquid  b. solid – gas
   c. liquid – solid  d. liquid – gas

2. Oil takes the .................... of its container.

   a. volume  b. shape  c. color  d. mass

3. If we cut a tomato into two halves, so the .................. of one half of the tomato will decrease to the half.

   a. color  b. mass  c. temperature  d. shape

4. All the following can be used to describe matter, except ..................

   a. shape.  b. color.  c. price.  d. texture.

**(B) Look at the following pictures, then complete the following sentences :**



Object (A)



Object (B)

1. Object (..................) is made of steel, because it is hard and strong.
2. Object (..................) is made of glass, because it is transparent and smooth.

# Self-Assessments
## on Concept (2.3)

### Self-Assessment 23 On Lesson 1

**1** **(A) Complete the following sentences using the words below :**

**(heated – mass – melting)**

1. If we mix an amount of oil with an amount of vinegar, the ............ of both of them will not change.
2. Ice is turned into water by ............ process.
3. When a matter is ............ , its particles speed will increase.

**(B) Give a reason for the following :**

Thermal energy is very important in our daily life.

..............................................................................................................................

**2** **(A) Correct the underlined words :**

1. When the temperature of ice increases, it melts and turns into <u>steam</u>. (......................)
2. Melting process changes the matter from solid state to liquid state by <u>cooling</u>. (......................)
3. When a matter is heated, its particles move <u>slower</u>. (......................)

**(B) What happens if ... ?**

You leave some cubes of ice in a warm room.

..............................................................................................................................

**3** **Look at the following pictures, then choose the correct answer :**


(A)


(B)


(C)

1. The solid state of water is picture ................ (A - B - C)
2. The liquid state of water is picture ................ (A - B - C)
3. The gas state of water is picture ................ (A - B - C)
4. In which picture the particles of matter are close together ? ................ (A - B - C)

## Self-Assessment 24 till Lesson 2

**1** **(A) Complete the following sentences using the words below :**

**(thermal - heating - condensation)**

1. Melting and evaporation take place by ............
2. When ice gain ............ energy, its temperature increases and changes into water.
3. We can change water vapor into water by using ............ process.

**(B) Give a reason for the following :**

When the temperature of liquid water decreases, it freezes.

..........................................................................................................................

**2** **(A) Correct the underlined words :**

1. Freezing and evaporation take place by decreasing temperature. (......................)
2. Melting process cause the particles of matter to move close to each other. (......................)
3. Evaporation changes water into ice. (......................)

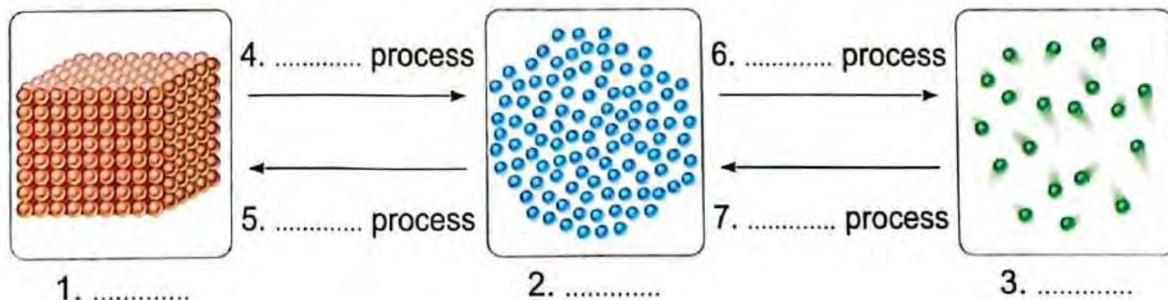
**(B) What happens to ...?**

The distance between particles of water vapor when it touchs a cold surface.

..........................................................................................................................

**3** **Use the following words to complete the following diagram :**

**(Evaporation - Water - Melting - Water vapor - Condensation - Ice - Freezing)**




## Self-Assessment 25 till Lesson 3

**1** **(A) Complete the following sentences using the words below :**

**(mass - temperature - filtration - properties)**

1. When ice melts and changed into water, its ............ will increase.
2. We can separate sand from sand and water mixture by using ............ process.
3. In salty water, the ............ and ............ of salt and water don't change after mixing.

**(B) Give a reason for the following :**

Sweet taste of sugar doesn't change after mixing an amount of sugar with water.

..........................................................................................................................

**2** **(A) Correct the underlined words :**

1. In evaporation process, the particles of matter move slower and spread far from each other. (..................)
2. Changing of matter from liquid state to gas state needs cooling. (..................)
3. Mixing salt and pepper form a compound which has the same properties of its components. (..................)

**(B) What happens to ...?**

The mass of some apple pieces if we mix them with some pieces of banana.

..........................................................................................................................................

**3** **On dissolving the salt in figure(A), we made salty water mixture in figure(B). Choose the correct answer :**



Salt–figure (A)



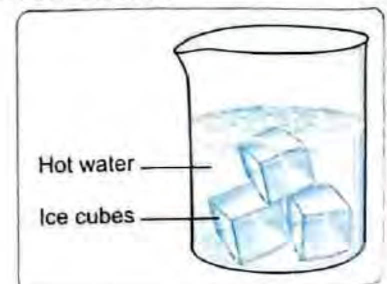
Salty water–figure (B)

1. The mass of salt in figure (B) equals .................. gm. (20 – 30 – 50)
2. The mass of water in figure (B) equals .................. gm. (20 – 30 – 50)
3. If we increase the mass of salt in figure (A) to 30 gm and mix it with the same amount of water, so the mass of salt in the new mixture will be .................. gm. (20 – 30 – 50)
4. The taste of salt in figure (B) will .................. (remain as it is – disappear – change into another taste)

## Self-Assessment 26 till Lesson 4

**1** **(A) Choose the correct answer :**

1. Both of .................... processes need increasing in temperature.
   a. evaporation and freezing
   b. melting and freezing
   c. melting and evaporation
   d. freezing and condensation
2. Which of the following changes take place in this activity ? ..................
   a. The hot water take heat from the ice cubes.
   b. The hot water changes from liquid to solid.
   c. The ice cubes change from solid to liquid.
   d. The ice cubes change from solid to gas.



3. Cutting a paper into small pieces causes a change in its ....................
   a. shape only. b. size only.
   c. shape and color. d. shape and size.

### (B) Give a reason for the following :

Coloring a paper is considered as a physical change.

..........................................................................................................................................

## 2 (A) Correct the underlined words :

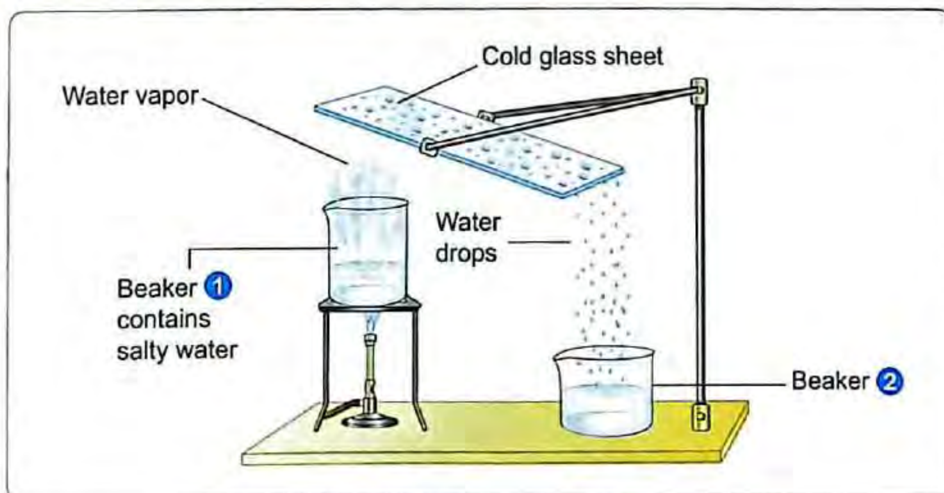
1. Boiling of water changes it into solid state. (........................)
2. Mixing baking soda with vinegar forms a mixture which has new chemical properties. (........................)
3. Producing ash from burning of wood is considered as a physical change. (........................)

### (B) What happens if ... ?

You leave a piece of wet iron wire in air for a long period of time.

..........................................................................................................................................

## 3 Look at the following figure, then answer the questions :




1. What is the process that takes place in beaker 1 ?

..........................................................................................................................................

2. What is the process that takes place on the cold glass sheet ?

..........................................................................................................................................

3. What is the type of change that occurs in the two breakers ?

..........................................................................................................................................

4. What will be left in break 1 after a long period of time ?

..........................................................................................................................................

## Self-Assessment 27 till Lesson 5

### 1 (A) Choose the correct answer :

1. All the following can pass through filters during desalination of water, except ....................
   a. salts. b. minerals. c. seaweed. d. gases.
2. On decreasing the temperature of water vapor, it ....................
   a. freezes. b. condenses. c. melts. d. evaporates.
3. The change produced as a result of coloring a paper is the same change produced from ....................
   a. rusting of iron. b. mixing baking soda with vinegar.
   c. mixing iodine with starch. d. melting of wax.

### (B) Give a reason for the following :

The water of seas and oceans is considered as a mixture.

..........................................................................................................................................

### 2 (A) Put (✓) or (✗) :

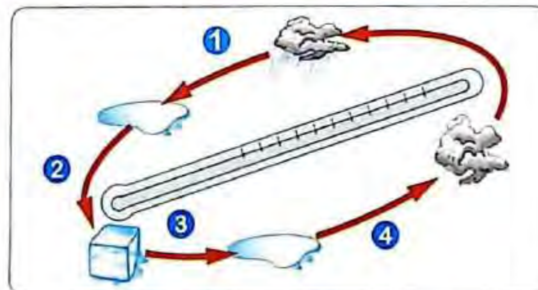
1. After desalination process, the water that is returned back to oceans is useful to marine life. (  )
2. Dehydration means that human body loses water. (  )
3. The change of water into water vapor is a physical change. (  )

### (B) What happens to ...?

Movement of ice particles, when it is exposed to Sun rays for a short period of time.

..........................................................................................................................................

### 3 Look at the following figure, then answer the questions below :




1. Number .................... indicates condensation process, while number .................... indicates evaporation process.
2. Number .................... indicates melting process, while number .................... indicates freezing process.
3. Mention the type of change happening in this figure ?

..........................................................................................................................................

# Model Exam
## on Theme (2)

Total mark
___
15

**1 (A) Choose the correct answer :** *(5 marks)*

1. Steel is used in making hammers, because it is ..................
   a. flexible. b. smooth. c. transparent. d. hard.
2. We can use filtration process to remove all the following from sea water, except ..................
   a. seaweed. b. salt. c. shells. d. fish.
3. Both .................. and .................. are solids as they have definite shape and volume.
   a. wood – oxygen b. milk – iron
   c. wood – iron d. milk – oxygen
4. To separate sand only from salty water, we can use .................. process.
   a. filtration b. evaporation c. melting d. freezing

**(B) Give a reason for the following :**

Sometimes we need to use an electron microscope.

..........................................................................................................

**2 (A) Complete the following sentences using the words below :** *(5 marks)*

**(ceramic tiles – physical – rough – solid)**

1. You can describe the texture of sugar crystals by saying "it has .............. crystal texture".
2. Boiling of water to form water vapor is considered as a .............. change.
3. The distance between particles of water is very small in case of its .............. state.
4. In Earth's polar zone, people use .............. to build their home roofs to protect them from rain.

**(B) What happens if ... ?**

A piece of ice is exposed to Sun rays for a period of time.

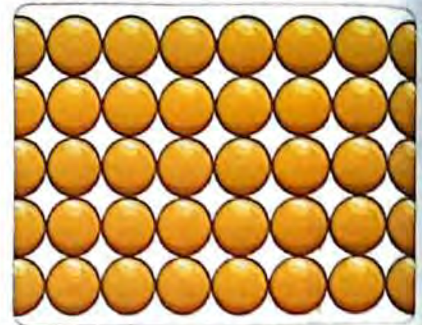
..........................................................................................................

**3 (A) Choose from column (B) what suits it in column (A) :** *(5 marks)*

| (A) | (B) |
|---|---|
| 1. Milk | a. its particles are packed tightly. |
| 2. Air | b. its part icles have medium energy. |
| 3. Wood | c. its particles move very freely. |
| | d. its particles don't move at all. |

1. .................. 2. .................. 3. ..................

**(B) Look at the opposite ball model that shows the particles of a matter, then complete the following sentences :**



1. This model represents a matter in .................... state.
2. If we want to make changes in this model to show this matter in a liquid state, we should .................... the distance between balls.

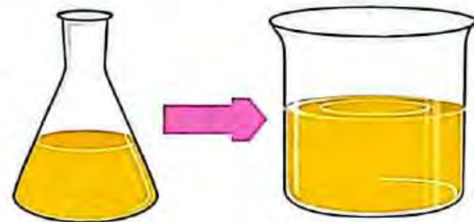
# Assess your Learning

## Questions of the School Book on Theme (2)

**Choose the correct answer :**

1. Which of the following are compressible (Water vapor, Oxygen, Nitrogen) ? ..........
   a. Water vapor and oxygen only.
   b. Oxygen and nitrogen only.
   c. Water vapor and nitrogen only.
   d. All water vapor, oxygen and nitrogen.

2. When the oil is transferred from the container "P" to "Q" as shown in the opposite figure, which of the following undergoes change ? ..........



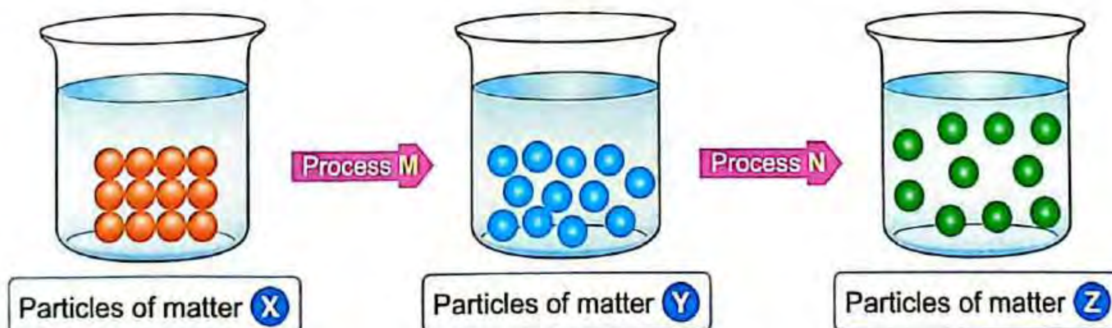
   a. Volume.
   b. Mass.
   c. Shape.
   d. Temperature.

3. Ice cubes melt when they gain .......... energy.
   a. electrical
   b. light
   c. sound
   d. thermal

4. .......... is the process by which water changes into ice.
   a. Melting
   b. Freezing
   c. Evaporation
   d. Condensation

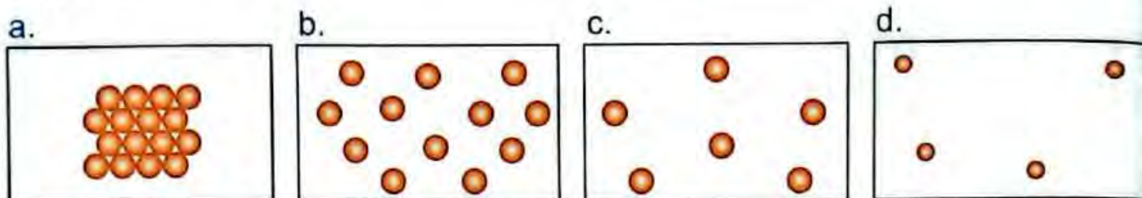
5. Select the false statement from the following : ..........
   a. Matter exists in three states.
   b. Matter is changeable from one state to another.
   c. A new substance is formed by a chemical reaction.
   d. Ice is heavier than water.

6. Study the following figure, then choose the correct answer :

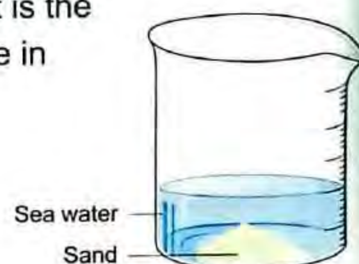



   a. X is a solid state – Z is a gaseous state – M is melting process.
   b. X is a solid state – Y is a liquid state – N is freezing process.
   c. Y is a liquid state – Z is a solid state – N is evaporation process.
   d. Y is a liquid state – Z is a gaseous state – M is condensation process.

7. From the following figures, in which one of them the particles have greatest amount of energy ? ...........



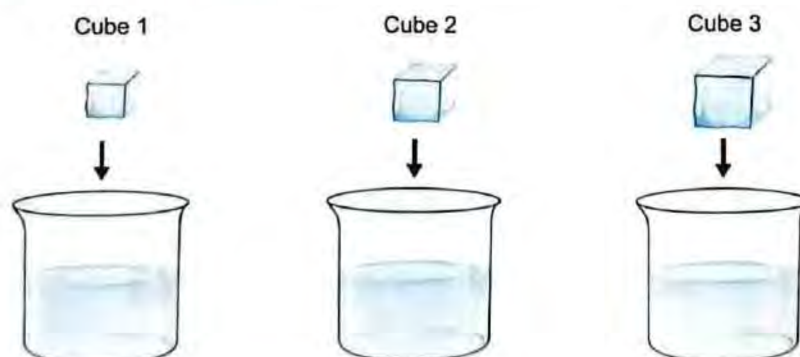

8. If you have a filter paper, a glass sheet, and a flame, what is the correct order of operations to be carried out for the sample in front of you to obtain drinkable water ? ...........




a. Evaporation ⟶ Filtration ⟶ Condensation.
b. Evaporation ⟶ Condensation ⟶ Filtration.
c. Filtration ⟶ Evaporation ⟶ Condensation.
d. Filtration ⟶ Condensation ⟶ Evaporation.

9. Which of the following is an evidence that a chemical change has occurred ? ...........
a. Smoke billowing (smoke rising).
b. Cracking nuts.
c. Squeezing a balloon filled with air.
d. Melting of a piece of wax.

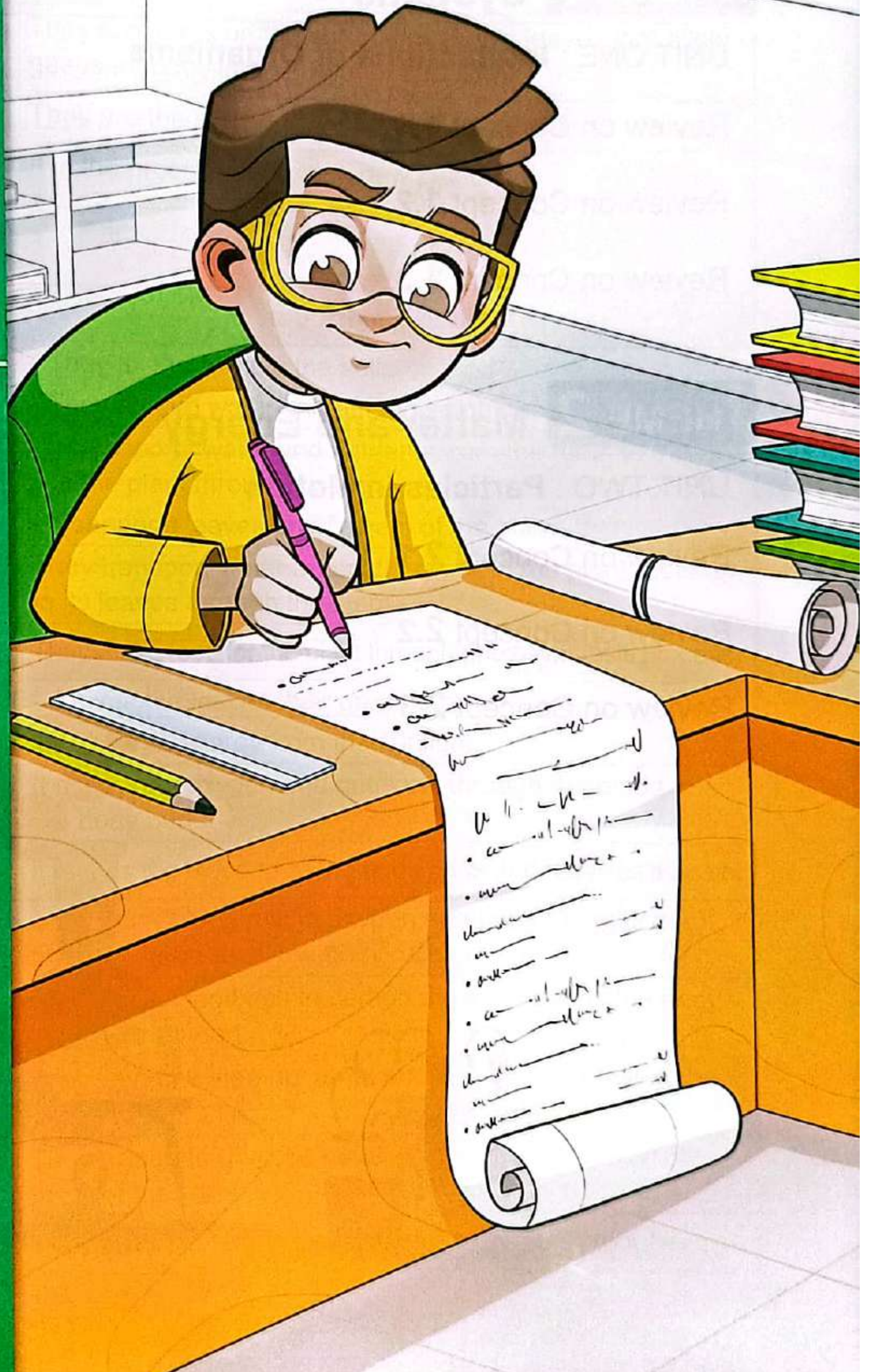
10. A student has three ice cubes of different sizes, and three identical containers contain the same amount of water. The student puts each ice cube in each container as shown in the drawing.




What happens to ice cubes when they are placed in water ? ...........
a. Cubes 1, 2, 3 sink.
b. Cubes 1, 2, 3 float.
c. Cube 1 floats, while cubes 3 and 2 sink.
d. Cubes 1 and 2 float, while cube 3 sinks.

# FINAL REVISION

# PART 2



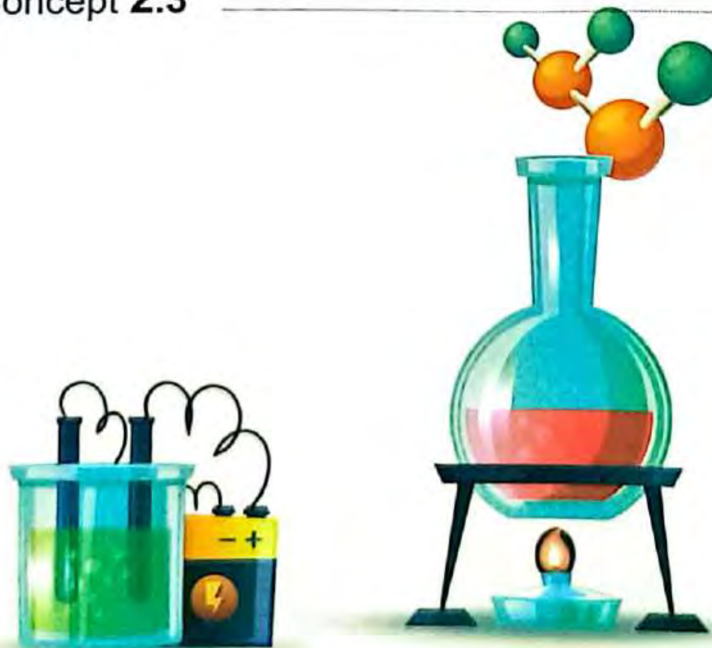
# Contents of Part Two | Final Revision

## THEME 1 Systems



## THEME 2 Matter and Energy





# Review on Concept (1.1)

## 1 Scientific terms (Definitions) :

| Scientific terms | Definitions |
|---|---|
| 1. Photosynthesis process : | It is the process through which the green parts of plants (leaves) absorb sunlight to make their own food. |
| 2. Stomata : | They are pores on the surface of plant's leaves that allow gases to move into and out of the plant. |
| 3. Flowers : | They are the reproductive parts of many plants. |
| 4. Plant reproduction : | It is the process of making new plants. |

## 2 Importance or uses :

| Items | Importance or uses |
|---|---|
| 1. The plant roots : | - They fix the plant in the soil.<br>- They absorb water and nutrients from the soil to the plant. |
| 2. The plant stem : | - It transports water and nutrients from the roots to the rest of the plant through xylem.<br>- It supports leaves and flowers of the plant. |
| 3. Xylem vessels : | They transport water and nutrients from the plant roots up to its leaves through the stem. |
| 4. The plant leaves : | They make food for the plant through photosynthesis process. |
| 5. Chlorophyll : | - It gives the leaves their green color.<br>- It absorbs energy from the sunlight. |
| 6. Human circulatory system : | It transports oxygen and nutrients through the blood to all the body parts. |
| 7. Heart : | It pumps the blood to all the body parts and receives it again. |
| 8. Arteries : | They carry blood rich in oxygen and nutrients (glucose) from the heart to all the body cells. |
| 9. Veins : | They carry blood rich in carbon dioxide from all the body parts to the heart. |
| 10. Plant transport system : | It transports water, nutrients and plant food between the plant parts. |
| 11. Phloem vessels : | They transport glucose sugar from the leaves to all other parts of the plant. |
| 12. Flowers : | They produce seeds that help the plant to reproduce. |

## 3 Give reasons for :

1. **Roots have important role in photosynthesis process of plants.**
   Because they help the plant to absorb water and nutrients from the soil.
2. **Photosynthesis process is important for plants to survive.**
   Because it helps the plant to make its own food.
3. **Green plants can make their own food.**
   Because they can make photosynthesis process.
4. **The presence of hairlike structures in plant's roots.**
   To increase the amount of absorbed water and nutrients that the plant needs.
5. **Xylem vessels are important for the plant.**
   Because they transport water and nutrients to the plant's leaves.
6. **The presence of stomata on the surface of plant's leaves.**
   To allow gases to move into and out of the plant.
7. **Chlorophyll in plant's leaves has an important role in photosynthesis process.**
   Because chlorophyll absorbs the energy from sunlight that helps the plant to make photosynthesis process.
8. **There is no life on Earth in the absence of plants.**
   Because plants produce oxygen gas during photosynthesis process which is important for all living organisms to breathe.
9. **Xylem in plant is a one-way vessel.**
   Because xylem carries water and nutrients from the roots to the leaves.
10. **Flowers are important parts for the plant.**
    Because flowers produce seeds for the plant that help it to reproduce.
11. **Seeds dispersal may take place by animal in two different ways.**
    Because seeds can stick on animals fur or being eaten by animals and come out with their stool.
12. **Seeds of maple or dandelion plants can disperse through wind easily.**
    Because they are light seeds.
13. **Burr seeds can stick to animal fur.**
    Because their seeds are spiny seeds.

## 4 What happens if ...?

1. **Plants have no stems.**

   Water and nutrients will not be carried from the roots to the leaves.

2. **Plants can't get carbon dioxide gas from air.**

   Plants can't make their own food during photosynthesis process.

3. **We put a green plant in a dark room for many days.**

   Plant's leaves will be yellow and can't make photosynthesis process.

4. **We put a seed of bean in wet soil for many days.**

   It will germinate and grow well.

5. **We put a bean seed in a wet paper towel for more than two months.**

   It will germinate and make sprouts for a while, then it will die.

6. **A plant is placed in a dark place for many days.**

   The plant can't make photosynthesis process and it will die.

7. **The plant doesn't have roots.**

   The plant can't absorb water and nutrients from the soil and also can't be fixed in the soil.

8. **Stomata of a plant get closed for a long time.**

   Gases can't move into or out of the plant's leaves and the plant will die.

9. **Plant's leaves don't contain chlorophyll.**

   The plant can't absorb the energy from sunlight and can't make photosynthesis process.

10. **The plant stop making photosynthesis process for several days.**

    It can't make its own food and it will die.

11. **Plants can't produce glucose sugar during photosynthesis process**

    Plants can't get their needed energy to survive and grow.

12. **We remove the flowers of a plant.**

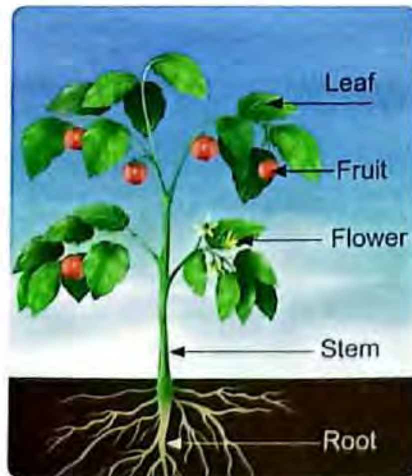
    The plant can't produce seeds that help it to reproduce.

## 5 Comparison :

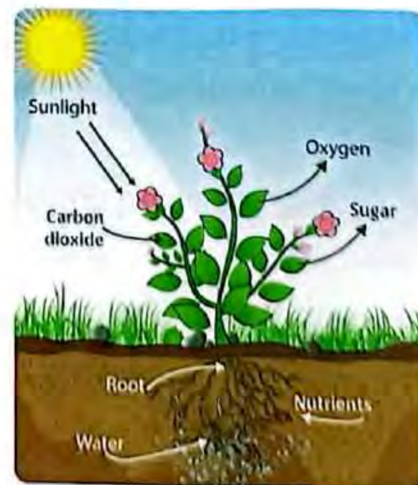
**Plant transport system and human circulatory system.**

| Plant transport system | Human circulatory system |
|---|---|
| **Similarities** | |
| - Both have vessels to transport water, nutrients and gases. | |
| - Both have one-way vessels. | |
| **Differences** | |
| - The transport system in plant is a system of tubes called xylem and phloem that transport different materials around the plant parts. | - The transport system in human is the circulatory system that moves blood around the human body. |
| - Xylem tubes carry water and nutrients from the roots to the leaves. | - Arteries carry blood rich in oxygen and nutrients from the heart to all the body parts. |
| - Phloem tubes carry sugars from the leaves to all the plant parts. | - Veins carry blood that contains carbon dioxide and a very small amount of nutrients and oxygen from all body parts back to the heart. |

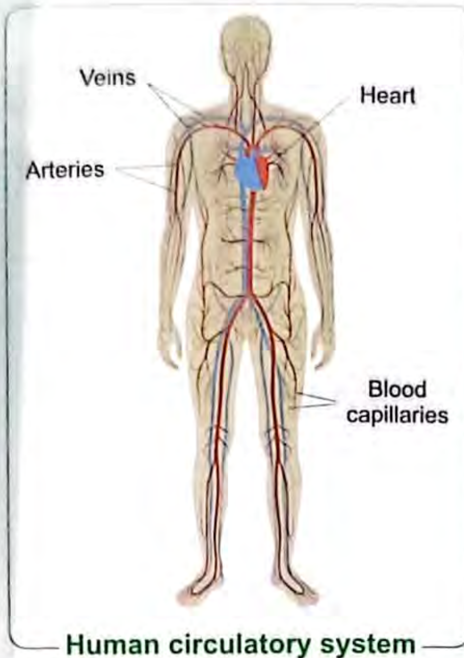
## 6 Important drawings :



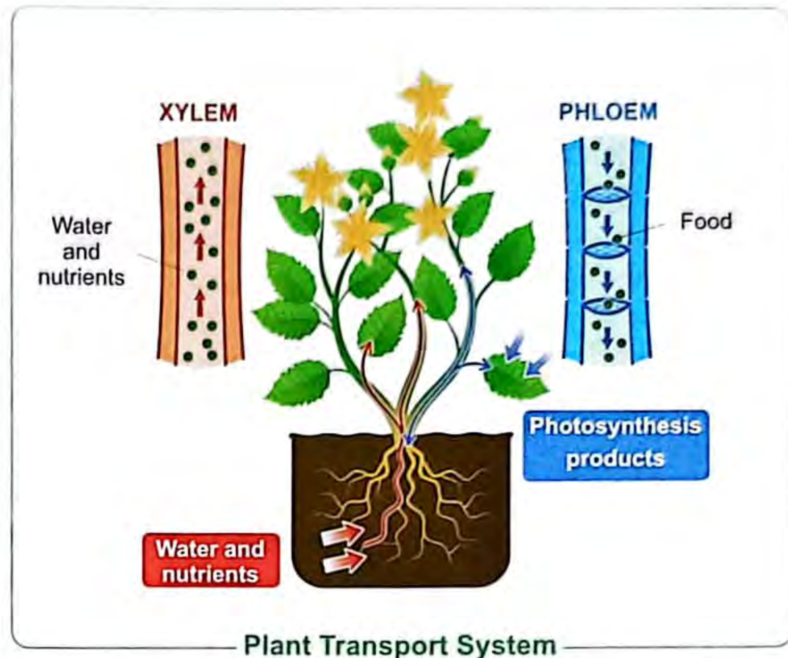
Plant parts



Photosynthesis process



Human circulatory system



Plant Transport System

## 7 Main points :

- Plants need water, air, sunlight, nutrients and space to grow.
- In the presence of water, seeds can grow (germinate) without soil.
- In the presence of water and sunlight, plants can grow without soil for a while but finally they need soil.
- Plants make their own food through photosynthesis process.
- Sunlight is important to plant growth, because plants use sunlight to make their own food, so the plant without sunlight does not grow well because it had less food.

---

- **How can plants make their own food through photosynthesis process ?**
  - Green plants use their leaves to collect sunlight and carbon dioxide from the air.
  - Plant roots absorb water from the soil.
  - Inside the green plants, sunlight allows carbon dioxide to combine with water to produce :
    * **Oxygen** which is released in the air to help living organisms breathe.
    * **Sugar** (the food of plant) which gives the plant the energy it needs to grow.
- During photosynthesis process, light energy of the Sun is transformed into chemical energy that is found in glucose.

---

- Plants roots have hairlike features (structures) called root hairs that increase the amount of absorbed water and nutrients that the plant needs from the soil.

---

- **How does photosynthesis process occur in plant leaves ?**
  - Chlorophyll absorbs energy from sunlight.
  - Green leaves use the light energy from the Sun to combine the carbon dioxide from the air with water.

- Leaves manufacture (produce) :
  * **Nutrients** (such as sugars, starches, fats and proteins) that the plant needs to survive.
  * **Oxygen gas** that animals and people need to breathe.
- As the photosynthesis process is completed inside the leaves, there are tubes called phloem that transport the food materials from the leaves to the other parts of the plant.

---

- **Forms of stems :**
  - Some plants have wood stems, such as tree trunks and shrubs.
  - Most flowers have upright stems.
  - Some plants have climb stems, such as vines (grapes).
  - Some stems extend underground and they are called tubers, such as potato plant.
  - Some stems run along the ground and they are called runners.

---

- **There are many kinds of leaves such as :**
  - Narrow leaves that look like needles, such as pine trees.
  - Flat, wide leaves.

---

- The human circulatory system consists of heart and blood vessels.

---

- The human circulatory system has three different types of blood vessels which are arteries, veins and blood capillaries.
- Blood is the fluid that moves in only one direction in the human's arteries or veins.

---

- The plant transport system consists of xylem and phloem.

---

- The transport system in plants has one-way vessels that move important substances between the parts of the plant.

---

- When seeds receive air, water and suitable temperature, they can grow into a new plant.
- Seeds are transported from one place to another, this process is called seed dispersal.
- **Ways of seed dispersal in nature :**

| Ways of seed dispersal | Examples |
|---|---|
| Floating on water | **Coconut seeds** |
| Traveling by wind | **Maple seeds – Dandelion seeds** (both of them are light seeds) |
| Sticking to animal fur | **Burr seeds** (have spines) |
| Being eaten by animals | **Tomato seeds – Apple seeds** |

# Review on Concept (1.2)

## 1 Scientific terms (Definitions) :

| Scientific terms | Definitions |
|---|---|
| **1. Ecosystem :** | It is an area (or community) that contains living organisms and nonliving things that interact with each other. |
| **2. Producers :** | They are organisms that can make their own food and don't feed on other plants or animals. |
| **3. Consumers :** | They are organisms that eat other living organisms to get their energy, because they cannot make their own food. |
| **4. Decomposers :** | They are organisms that carry out the process of decomposition by breaking down or decaying dead organisms. |
| **5. Food chain :** | It is a model that shows how energy passes from one organism to another in an ecosystem. |
| **6. Food web :** | It is a model that shows several interconnected food chains among living organisms. |

## 2 Give reasons for :

1. **Animals eat different types of food.**
   To get energy as they cannot produce their own food.
2. **Human needs to eat some animals and plants.**
   To get his needed energy to do his activities.
3. **Sunlight is important for all living organisms.**
   Because it is absorbed by the plants leaves to make their own food and grow, then humans and animals eat these plants.
4. **Consumers depend on producers to get their energy.**
   Because consumers cannot make their own food.
5. **Soil fertility depends on decomposers.**
   Because decomposers return nutrients of dead organisms back to the soil.
6. **Sticky seeds of some plants can stick to human clothes or an animal's body.**
   To disperse their seeds to other places.

## 3 What happens ...?

1. **If a hawk is placed in an ecosystem that doesn't contain any living organisms except plants.**

   The hawk moves away to search for food in another ecosystem.

2. **If there is no sunlight reaches the Earth's surface.**

   The plants cannot make their own food by photosynthesis process, so there will be no life on Earth.

3. **If all primary consumers disappear from a certain food chain.**

   The secondary consumers will move away to another place to search for food or they will die.

4. **If all types of decomposers are absent from an ecosystem.**

   Dead organisms will not be decomposed and their nutrients will not return back to the soil.

## 4 Main points :

- The interaction between different components of an ecosystem depends on the flow of energy through these components.
- Energy flows (moves) through an ecosystem from plants to animals and also between animals when they eat each other.
- When living organisms die, they decompose and their energy is returned to the soil.
- Hawks do not eat plants, but they eat animals who eat plants, so they also depend on plants for energy.

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- An ecosystem is a community that provides food, water and shelter to all living organisms live in it.
- There are many different ecosystems on the Earth such as an ocean, a rainforest, a desert or the tundra.

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- We need energy to do all activities in our daily life such as thinking, breathing and moving.
- There are some activities require a lot of energy such as hard work or doing exercises.

---

- The Sun is the primary source of energy for all organisms on Earth to live, grow and carry out life processes.

- Plants can make their own food through photosynthesis process by absorbing the sunlight through their leaves and use the sun's energy to convert water and carbon dioxide gas into glucose sugar.
- Animals including humans cannot make their own food, but they get energy from the environment in which they live.

---

- **There are three types of consumers which are :**
  - Primary consumers : they are animals that eat plants, such as many insects.
  - Secondary consumers : they are animals that eat the primary consumers, such as birds.
  - Tertiary consumers : they are animals that eat the secondary consumers, such as alligators.

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- Worms and millipedes are considered as decomposers that eat dead matter and produce waste which is rich in nutrients that increase the soil fertility for plant growth.

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- Any animal that is hunted and eaten by another animal is called "prey".
- Any consumer that hunts and eats another animal is called "predator".

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- A food web shows interactions among many food chains so, the food web contains many organisms, while a food chain shows interactions between just few organisms.

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- Restoration ecology means "rebuilding habitats that are damaged".
- **Different plants need different ways to disperse their seeds, where :**
  - There are plants with sticky seeds that stick to human clothes or an animal's body, so human or animal can carry these seeds to another place where seeds fall down.
  - Other plants have light seeds that are dispersed by wind, these seeds are carried away by winds to new habitats to grow in other places.

# Review on Concept (1.3)

## 1 Scientific terms (Definitions) :

| Scientific terms | Definitions |
|---|---|
| 1. Population : | It is the number of organisms of one type of species living in an area. |
| 2. Habitat restoration : | It is the process of returning a habitat back to its natural state before harm was done. |

## 2 Give reasons for :

1. **When the number of one species of consumers in an ecosystem increases, they will die.**
   Because they will not find enough food to eat.
2. **Death of algae may lead to moving sharks away to another places.**
   Because sharks feed on different fish that depend on algae to get their food.
3. **Change in the population of one species affects the population of other species.**
   Because in the ecosystem, all species depend on other species to survive, so an increase or decrease in one species affects the population of other species.
4. **Coral bleaching happens when the water temperature rises.**
   Because when the water temperature rises the coral reefs get rid of algae from their tissues and turn completely into white causing coral bleaching.
5. **Plastics are very harmful to marine organisms.**
   Because plastics are toxic and sharp.
6. **When we remove plants from riverbanks, the floods become more dangerous.**
   Due to eroding of riverbanks.

## 3 What happens ...?

1. **If people throw big amounts of plastic garbage and waste materials in water.**
   They will pollute water and the marine organisms will be negatively affected.
2. **If a small lake is exposed to extreme hot climate for several months.**
   The water of the lake decreases due to its evaporation and may completely disappear.

**3. If the number of secondary consumers in an ecosystem decreases**

The number of primary consumers increases and the amount of producers decreases.

**4. If the climate change is unsuitable for a population of one type of species.**

The population of this species will decrease.

**5. If the seawater becomes warm.**

The microorganisms will move away to a cooler water and also fish that feed on microorganisms.

## 4 Main points :

- Relationship between all the components of an ecosystem play an important role in keeping this ecosystem balanced.
- When an ecosystem changes, food webs in this ecosystem change too.
- Top predators are consumers that exist at the top of food chains, such as tigers, lions, sharks, crocodiles, ... etc.
- Although energy is transferred between living organisms, most of the energy is recycled by decomposers back into the ecosystem.

---

- Any increase or decrease in the number of organisms of one type of species living in an area is known as "population change".
- Seabirds feed on small fish which feed on microorganisms that float on the surface of the sea.
- Microorganisms can make their own food and they are found in cold water habitats.
- The climate change affects the population of a species, where :
  - When the climate is suitable, the population of a species increases.
  - When the climate change is unsuitable, the population of a species decreases because the organisms would either die or move to another place.

---

- Some human activities can change the habitats in an ecosystem such as :
  - Building up more buildings and roads.
  - Throwing waste materials in water.
  - Overfishing in seas and oceans.
- Human activities can also impact the weather and nonliving factors in an ecosystem, such as the temperature of ocean water.

- The changes in the habitats can cause habitat loss which is one of the main causes of extinction.
- Healthy habitats are important to all organisms in a food web, because they provide organisms with resources that they need to survive as air, food, water and shelter.
- When habitats are destroyed, different organisms may not be able to survive and this will negatively affect the flow of energy in the food web.

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- Coral reefs are some of the most diverse and valuable ecosystems on Earth.
- Coral reefs provide food and shelter for large numbers of fish and other marine organisms and also they are important for tourism.
- Coral bleaching happens when the water temperature rises.

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- Sea turtles cannot differentiate between a jellyfish and a piece of plastic in the water.
- Plastic products get broken down into smaller pieces called microplastics.
- When corals filter the seawater to get their food, they ingest microplastics that are as small as the pieces of food that corals get from the water, so corals get harmed.
- People can decrease their use of plastic products or recycle them instead of throwing them in the sea.
- Nursery is an area in the sea or ocean, where scientists take care of small pieces of coral until they grow up and can be moved back to the reefs where they were dying.
- In Egypt, coastal communities near the coral reefs use a new way of life known as "zero plastics", where people in these communities decrease using of one-use plastic products.

# Review on Concept (2.1)

## 1 Scientific terms (Definitions) :

| Scientific terms | Definitions |
|---|---|
| **1. Matter :** | It is anything that has a mass and takes up space. |
| **2. Model :** | It is a copy that is similar to a real. |

## 2 Importance or uses :

| Items | Importance or uses |
|---|---|
| **1. Measuring tap (tape measure) :** | It is used to measure the length of some matter. |
| **2. Scale (balance) :** | It is used to measure the mass of some matter. |
| **3. Thermometer :** | It is used to measure the temperature of some matter. |
| **4. Normal microscope :** | It helps us see some particles of matter. |
| **5. Electron microscope :** | It helps us see one tiny particle such as (one blood cell). |
| **6. Globe :** | It helps us see the shape of Earth, how much of Earth is covered with water and where different countries are located. |
| **7. Model of solar system :** | It helps us see all planets at once and compare between planets which one is the biggest and which one is the closest to Earth. |
| **8. Model of a germ :** | It helps us see the shape of a germ without microscope and see different parts of a germ that help it spread from one person to another. |
| **9. Model of volcano :** | It helps us see the shape of volcano and how the liquid that comes out of a volcano during a real eruption. |
| **10. Model of airplane :** | It shows us how airplane filies up into the air. |
| **11. Model :** | It helps us :<br>- Teach something about the real things it copies<br>- See and understand how things work.<br>- Learn about many things at just the right size.<br>- Know what we could not otherwise see. |

## 3 Give reasons for :

1. **Salt is a matter.**
   Because it has mass and volume.
2. **Sugar is a solid matter.**
   Because it has definite shape and volume.
3. **Wood has definite shape and volume.**
   Because it is a solid matter.
4. **Oxygen has no definite shape or volume.**
   Because it is a gas matter.
5. **Particles of a piece of iron are very close to each other.**
   Because it is a solid matter.
6. **Water has different shapes when it is placed in some containers that have different shapes.**
   Because it has no definite shape and takes the shape of its container.
7. **Using models to study some scientific concepts.**
   To study them in an easier way.
8. **Sometimes we need to use on electron microscope.**
   Te see each tiny particle as it is more powerful than normal microscope.
9. **Particles of gases can spread out quickly to fill up any container they are put in.**
   Because they are not held together.
10. **Liquids take the shape of their containers.**
    Because their particles can slide over each other.
11. **Scientists make model of germs.**
    To see the shape and parts of germs without microscope.
12. **Oil used in cooking is considered as an example of liquid matter.**
    Because it has no definite shape and definite volume.

## 4 What happens ...?

1. **To the state of water after it is heated in the kettle for few minutes.**
   It changes from liquid state into gas state.
2. **To the shape of water if we put three equal amounts of water in three different containers.**
   It will take the shape of each container.

3. **To the volume of a coin if we move it from a cup to another cup**
   It will not change.
4. **To the shape of water if it changes into ice.**
   It will have definite shape.
5. **To the speed of particles of an ice cube when it is exposed to the Sun.**
   It will increase.
6. **To the size of a balloon when you blow it up.**
   It will increase.
7. **To the speed of particles of liquid when it changes into gas.**
   It will increase.
8. **To the arrangement of particles of water after its freezing.**
   It will be organized.
9. **To the state of milk if we put small amount of it in the freezer for few hours.**
   It changes from liquid state to solid state.

## 5 Comparison :

| Solids | Liquids | Gases |
|---|---|---|
| **Particles :** | **Particles :** | **Particles :** |
| • They are very close to each other (packed tightly). | • They have more spaces. | • They have a lot of spaces. |
| • They have less energy. | • They have more energy. | • They have a lot of energy. |
| • They move only a little bit. | • They can move more freely. | • They move very freely. |
| • They cannot move separately from one place into another. | • They move faster than solid particles. | • They have a random arrangement (not organized at all). |
| • They cannot slide over each other. | • They can slide over each other. | |
| • They have a regular pattern (organized). | • They have a random arrangement (not well organized). | |

| | | |
|---|---|---|
| **Shape and volume :**<br>• They have definite shape and volume.<br>• Their shape doesn't change unless something is happening to change them. | **Shape and volume :**<br>• They don't have definite shape but they have definite volume.<br>• They take the shape of their containers. | **Shape and volume :**<br>• They don't have definite shape and volume.<br>• They completely fill their containers and take their shapes. |
| **Examples :**<br>Ice , wood , iron , ... etc. | **Examples :**<br>Water, oil, gasoline , ... etc. | **Examples :**<br>Water vapor, oxygen, carbon dioxide, ... etc. |

## 7 Main points :

- **Water can be found in the three states of matter, where :**
  - Solid state : ice cubes.
  - Liquid state : water.
  - Gas state : water vapor (steam).
- Water can be changed from one state into another.

---

- All matter are made up of tiny particles that we cannot see with our eyes.
- Matter can change from one state to another state such as :

$$\text{Solid state} \underset{\text{Freezing}}{\overset{\text{Melting}}{\rightleftharpoons}} \text{Liquid state}$$

- There are something that are not matter such as light and sound which are forms of energy.
- If there are two objects, they cannot take up the same space at the same time.
- Particles are the building unit of matter.

---

- **When a cup of ice cubes placed on a table exposed to the Sun in a hot summer day :**
  - The Sun will heat up the particles of ice cubes.
  - Then, the particles of ice cubes will move faster and turn into water.
  - And the Sun heats up the particles of water so, they move faster and the water will evaporate.

---

- **Chefs use different states of matter to change ingredients such as :**
  - Bolling some water to cook pasta or rice, where water (liquid state) changes into steam (gas state).
  - Freezing vegetables keep them fresh and ready to use for longer periods of time.
  - Leave a cup of juice of milk in freezer to change from liquid state into solid state.

# Review on Concept (2.2)

## 1 Scientific terms (Definitions) :

| Scientific terms | Definitions |
|---|---|
| **1. Physical properties :** | They are properties which can be observed with your five senses |
| **2. Chemical properties :** | They are properties which can be observed and measured by the changes that happen in this material when it interacts with other materials. |
| **3. Volume :** | It is the amount of space that matter takes up. |
| **4. Mass :** | It is a measure of the amount of matter. |
| **5. Temperature :** | It is a measure of how quickly the particles in a matter are moving. |
| **6. Conduction :** | The ability of materials to transfer heat and conduct electricity. |

## 2 Importance or uses :

| Items | Importance or uses |
|---|---|
| **1. Measuring cup :** | It is used to measure the volume of objects. |
| **2. Tape measure :** | It is used to measure the length of objects. |
| **3. Ruler :** | It is used to measure the length of objects. |
| **4. Balance :** | It is used to measure the mass of objects. |
| **5. Thermometer :** | It is used to measure the temperature of objects. |
| **6. Helium :** | - It is used to fill balloons.<br>- It is used to fill blimps. |
| **7. Copper :** | - It is used in making electrical wires.<br>- It is used in making cooking pans. |
| **8. Steel :** | It is used in making screwdrivers and hammers. |
| **9. Glass :** | It is used in making windows, light bulbs and eyeglasses. |
| **10. Rubber :** | It is used in making tires, gloves and athletic shoes. |

## 3 Give reasons for :

1. **The roof of desert home is made of strong stones.**
   To protect the desert home from dust and dirt.
2. **The roof of tropical rainforest home is made of leaves and sticks.**
   To protect the tropical rainforest home from animals getting inside.
3. **You can use the sense of sight only to differentiate between salt and pepper.**
   Because both of salt and pepper have different colors.
4. **Rusting of iron is considered from chemical properties of matter.**
   Because rusting of iron is a change that happens to iron when it interacts with air and water.
5. **When the particles of a matter move quickly, its temperature increases.**
   Because quickly moving particles produce more heat energy which cause increasing in temperature.
6. **Helium is used to fill balloons and blimps.**
   Because helium is lighter than air.
7. **Human can use helium gas safely.**
   Because helium is not flammable or poisonous.
8. **Wood and plastic are used in making handles of cooking pans.**
   Because wood and plastic are bad conductors of heat.

## 4 What happens ...?

1. **If the roofs of cold weather homes is flat.**
   The rain will be collected on the top of cold weather homes.
2. **To a piece of paper if it interacts with fire.**
   The paper becomes ash.
3. **To the temperature of a matter if the speed of its particles decreases.**
   The temperature of the matter will decrease.
4. **To an iron nail and a plastic spoon if they are put close to a magnet.**
   The iron nail will attract to the magnet, while the plastic spoon will not attract to the magnet.
5. **To a piece of cork if it is put in water.**
   The piece of cork will float on the surface of water.

6. **If a blimp is filled with helium gas.**

The blimp will rise up in the air.

7. **If electrical wire is made from wood instead of copper.**

It will not conduct electricity.

## 5 Comparisons :

**1. Desert home, cold weather home and tropical rainforest home:**

| Points of comparison | Desert home | Cold weather home | Tropical rainforest home |
|---|---|---|---|
| **1. Material of the roof :** | Strong stones. | Ceramic tiles (ceramic bricks). | Leaves and sticks. |
| **2. Properties of roof material :** | - It is flat.<br>- It protects the home from dust and dirt. | - It is slanted (inclined).<br>- It protects the home from rains. | - It is slanted (inclined).<br>- It protects the home from animals getting inside. |

**2. Volume and mass :**

| Volume | Mass |
|---|---|
| It is the amount of space that matter takes up. | It is a measure of the amount of matter. |
| **The measuring units of volume are :**<br>- Liters (L).<br>- Mililiters (mL).<br>- Cubic centimeters ($cm^3$). | **The measuring units of mass are :**<br>- Gram (g).<br>- Kilogram (Kg). |
| 1L = 1000 mL = 1000 $cm^3$ | 1 Kg = 1000 g |
| **Example :** A big bottle of water contains 1 liters or more. | **Example :** A paperclip has a mass about 1 gram. |

**3. Physical and chemical properties of helium :**

| Physical properties of helium | Chemical properties of helium |
|---|---|
| It is a light gas which means it is lighter than air. | • It is not poisonous.<br>• It is not flammable (A flammable material means that this material burns and form fire). |

## 6 Important drawing :


Balance


Tape measure


Ruler


Measuring cup


Thermometer

## 7 Main points :

- The kind of material used to make a roof depends on the climate where the home is located.

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- Color, texture, odor and shape are some of the physical properties of matter.
- Volume, mass and temperature are physical properties of matter that you can measure.
- You may need to measure more than one property of material to determine if this material is the right one you can use in a certain purpose or not.
- You can use words such as rough, blue, round and sweet to describe the physical properties.

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- **Examples of chemical properties of some materials:**
  - The ability to burn such as when a paper interacts with fire, the paper becomes ash.
  - The ability to rust such as when an iron nail interacts with water and air, the iron nail rusts.

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- One liter of water has a mass of 1 kilogram.

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- Quickly moving particles produces more heat energy than slower moving particles.

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- Floating and sinking of a substance doesn't depend on its mass.

- Some substances are attracted to the magnet such as iron nail and some other substances are not attracted to the magnet such as stone, wood and cork.

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- Changing the shape of material doesn't affect its mass, but changing the size of material can affect the mass of it.

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- **Physical properties of copper:**
  - It can be shaped into thin, flexible wires.
  - It conducts electricity well (good conductor of electricity).
  - It conducts heat well (good conductor of heat).
- wood and plastic are bad conductors of heat so, they can be used in making handles of cooking pans.

---

- **Properties of some types of matter :**

| 1. Type of matter: | Steel | Glass | Rubber |
|---|---|---|---|
| **2. Properties of it:** | - Hard.<br>- Strong. | - Transparent.<br>- Smooth. | - Waterproof.<br>- Flexible. |

# Review on Concept (2.3)

## 1 Scientific terms (Definitions) :

| Scientific terms | Definitions |
| --- | --- |
| 1. Melting process : | It is a process in which a matter is changed from solid state to liquid state when its temperature increases (by heating). |
| 2. Freezing process : | It is a process in which a matter is changed from liquid state to solid state when its temperature decreases (by cooling). |
| 3. Evaporation process : | It is a process in which a matter is changed from liquid state to gas state when its temperature increases (by heating). |
| 4. Condensation process : | It is a process in which a matter is changed from gas state to liquid state when its temperature decreases (by cooling). |
| 5. Mixture : | It is the substance that consists of more than one matter which don't have any chemical change in their properties. |
| 6. Compound : | It is a matter that is formed when two or more materials combine chemically. |
| 7. Physical change : | It is a change in matter without any change in its structure. |
| 8. Chemical change : | It is a change in matter with a change in its structure producing a new matter (substance). |
| 9. Desalination : | It is the process of removing salt from water. |

## 2 Importance or uses :

| Items | Importance or uses |
| --- | --- |
| 1. Thermal energy : | It is used every day in many things such as cooking food and warming homes. |
| 2. Filtration : | It can be used to separate a mixture if one material in the mixture has smaller particles than the particles of other materials. |
| 3. Evaporation : | It can be used to separate materials that evaporate at different temperatures. |

## 3 Give reasons for :

**1. Ice is turned into water when it is placed in a warm room.**

Because the temperature of ice increases, so it will melt and becomes liquid.

**2. When particles of water absorb thermal energy, the water becomes warmer.**

Because the particles of water move faster, vibrate and spin around faster.

3. **When the temperature of ice cubes increases, they will melt.**
   Because ice cubes will gain thermal energy, so it changes to liquid water.
4. **Both melting and freezing processes are considered as physical changes.**
   Because in these processes the matter changes without any change in its structure.
5. **Formation of water drops when water vapor touches a cold surface.**
   Because water vapor loses thermal energy to the cold surface, so the particles of water vapor move slower and get close together forming water drops.
6. **Fruit salad and salty water are considered as mixtures.**
   Because they are formed of two or more materials.
7. **Filtration process is used to separate soil from water**
   Because the particles of water are smaller than that of soil.
8. **By adding baking soda to vinegar the properties of each of them are changed.**
   Because mixing baking soda with vinegar produces gas causing bubbles which means that the properties of the substances are changed.
9. **Making bread is considered as a chemical change.**
   Because the taste of bread is not like its ingredient which means that a new substance is formed.
10. **Formation of a layer with reddish color on the surface of a wet iron wire after a period of time.**
    Because when iron reacts with oxygen and water, it rusts (from a chemical substance called iron oxide).
11. **Formation of a bad odor when milk is left out of the fridge for several days.**
    Due to the chemical change that happens to the milk.
12. **Making fruit salad is considered as a physical change.**
    Because maxing fruit salad doesn't form a new substance.
13. **We cannot drink the water of oceans and seas.**
    Because it is a mixture of water, salt, other minerals, gases, living organisms and dead organisms.

## 4 What happens ...?

1. **To some ice cubes if we increase their temperature.**
   Ice cubes will melt and become liquid water.
2. **To the motion of water particles if we heat an amount of water.**
   The particles of water will move faster.

**3. To the particles of water when its temperature is decreased below 0°C.**

The particles of water release thermal energy and they move slower and get close together forming solid ice.

**4. To the particles of water when we increase its temperature above 100°C.**

The particles of water gain more thermal energy and they move faster and spread more forming water vapor.

**5. To salty water when heating it for a long time.**

The water will evaporate leaving the salt in the container.

**6. To the mass and properties of sugar when adding it to an amount of flour.**

The mass and properties of sugar will not change.

**7. If we mix iodine with cornstarch.**

A new substance is formed and its color is dark blue.

**8. If oxygen, carbon and hydrogen are combining together.**

They release heat that can start a fire.

**9. If you expose a shiny piece of metal to air (oxygen) for a long period of time.**

The piece of metal will lose it's shining.

**10. If you boil an amount of seawater for a long time.**

Water vapor rises up leaving salts and other minerals.

## 5 Comparisons :

**1. Melting and freezing processes :**

| Melting | Freezing |
|---|---|
| • In this process, the particles of a solid matter gain energy.<br>• This causes particles to move around more and their temperature increase.<br>• So, the matter changes to liquid state. | • In this process, the particles of liquid matter release energy.<br>• This causes particles to move slower and their temperature decrease.<br>• So, matter changes to solid state. |

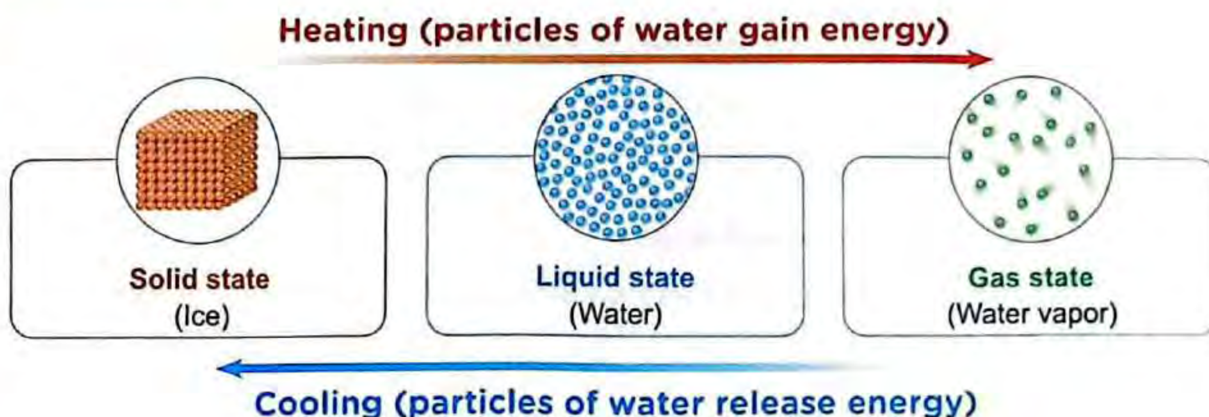
**2. Mixture and compound :**

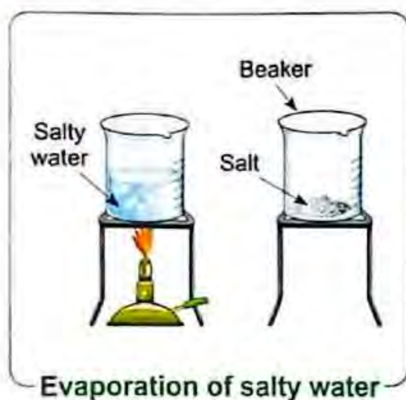
| Mixture | Compound |
|---|---|
| • A mixture is a matter formed of two or more materials.<br>• The materials that form a mixture don't combine chemically and mixing them does not change them into new substances. | • A compound is a matter formed of two or more materials.<br>• The materials that form a compound combine chemically to form a completely new substance. |

**3. Physical changes and chemical changes :**

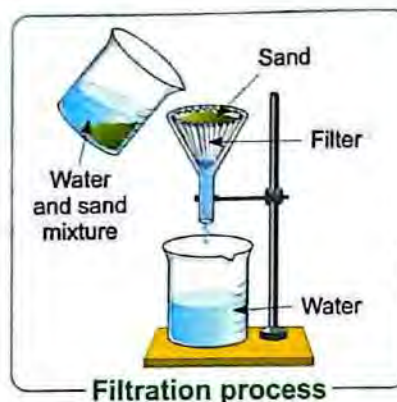
| Points of comparison | Physical changes | Chemical changes |
|---|---|---|
| **1. Definition :** | It is a change in matter without any change in its structure. | It is a change in matter with a change in its structure producing a new matter (substance). |
| **2. Reversibility :** | They are usually reversible. | They are not reversible easily. |
| **3. Examples :** | - Cutting a paper into small pieces.<br>• Making salad.<br>• Melting wax. | • When mixing iodine with cornstarch, a dark blue new substance is formed.<br>• When mixing baking soda with vinegar, gas bubbles appear.<br>• Leaving a cup of milk out of the fridge for about two days can produce a bad smell. |

## 6 Important drawings :





Evaporation of salty water



Filtration process

## 7 Main points :

- Thermal energy is not a physical thing (material) but it is an energy in the form of heat.

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- The thermal energy from the Sun keeps living things on the Earth alive.
- When particles of a matter absorb more thermal energy, they move, vibrate and spin around faster that causes this matter becomes warmer.
- When particles are cooled down, particles move slower and come close together.
- Light energy is like thermal energy when particles of a matter absorb them, particles move, vibrate and spin faster.

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- 0°C is known as the freezing point of water.
- Water is found in liquid state between 0°C and 100°C.
- (°C) is the measuring unit of temperature.

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- **Mixtures can be made of :**
  - Solid materials as : Sand and rocks.
  - Solid and liquid materials as : Salty water.
  - Gas materials as : Air.
- **Properties of mixture :**
  - It consists of two or more materials.
  - All materials that form a mixture don't combine chemically.
  - Each material in a mixture keeps its properties that you can use to identify it such as sugar does not lose its sweetness when it is dissolved in water.
  - The components of a mixture can be separated after mixing them by different methods such as filtration and evaporation.

- **Among evidences that describes physical changes are :** change in size, change in shape, expected change in color, change in state of matter.
- **Among evidences that describes chemical changes are :** unexpected color change, formation of gas bubbles, formation of strong odor.

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- Filtration of sea water removes any large materials such as seaweed, shells and fish only, but water, salts, minerals and gases would pass through filters that makes water still undrinkable.
- **Problems of desalination :**
  - It requires a lot of energy.
  - It is very expensive process.
  - It may lead to environmental problems such as :
    - Small marine organisms can be hurt due to sucking of water into the desalination plants.
    - The water that contains a very big amount of salt that is pumped back to oceans after desalination can be dangerous to the marine life.

# FINAL EXAMINATIONS:

- El-Moasser Final Examination Models.
- Final Examinations of Some Governorates.

3

PART



CamScanner

# El-Moasser Final Examination Models

## Model Exam 1

**1 (A) Choose the correct answer :**

1. Plants take .............. from the air to make its own food.
   a. water    b. oxygen gas
   c. carbon dioxide gas    d. sugar
2. A community that includes living organisms and nonliving things is known as ..............
   a. digestive system.    b. respiratory system.
   c. ecosystem.    d. vascular system.
3. When the marine habitats are destroyed, the number of living organisms in their food webs is ..............
   a. increased.    b. decreased.    c. not changed.    d. doubled.
4. Some liquids come out from a .............. during its eruption.
   a. star    b. wooden piece    c. volcano    d. plastic piece

**(B) Give a reason for the following :**

The roof of desert home is made of strong stones.

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**2 (A) Put (✓) or (✗) :**

1. We can describe a solid matter by its color and shape. (   )
2. The mass and properties of oil will change when mixing it with vinegar. (   )
3. Particles of all matter are in a continuous motion. (   )
4. Xylem helps the plant to get water from the soil. (   )

**(B) What happens if ...?**

A plant is placed in a dark place for many days.

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**3 (A) Complete the following sentences :**

1. Throwing plastic garbage and waste materials into a river causes water ..............
2. Both .............. organisms and .............. organisms cannot produce their own food.
3. Without .............. in the leaves of plants, gases can't move in or out of the plant.
4. Melting of wax is a .............. change, while burning of wood is a .............. change.

**(B) Cross out the odd word :**

1. Oil – Milk – Water – Wood. (..........................)
2. Roots – Stems – Leaves – Sunlight. (..........................)

# Model Exam 2

**1** **(A) Complete the following sentences :**

1. When we heat an ice cream, it .............. and becomes liquid.
2. Digestion of food is considered as a .............. change of matter.
3. We can use .............. in making hammers because it is .............. and strong.
4. You can use a .............. to measure the mass of a matter, while you can use a .............. to measure its temperature.

**(B) What happens to ... ?**

The speed of particles of an ice cube when it is exposed to the Sun.

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**2** **(A) Write the scientific term of each of the following :**

1. It is the number of organisms of one type of species living in an area. (........................)
2. The animal that is eaten by another animal. (........................)
3. The liquid substance that plants, animals and human need to survive. (........................)
4. A part of the plant that anchors it in the soil. (........................)

**(B) Give a reason for the following :**

Human needs to eat some animals and plants.

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**3** **(A) Choose from column (B) what suits it in column (A) :**

| (A) | (B) |
|---|---|
| 1. Condensation | a. is the change of water from solid state to liquid state. |
| 2. Melting | b. is the change of water from gas state to solid state. |
| 3. Freezing | c. is the change of water from gas state to liquid state. |
| 4. Evaporation | d. is the change of water from liquid state to gas state. |
| | e. is the change of water from liquid state to solid state. |

1. .............. 2. .............. 3. .............. 4. ..............

**(B) Correct the underlined words :**

1. Due to rising of water temperature, coral reefs turn completely into green. (........................)
2. Tree trunks are climb stems. (........................)

# Model Exam 3

**1 (A) Put (✓) or (X) :**

1. Air enters plants through roots. ( )
2. All plants need the same way to disperse their seeds. ( )
3. If coral reefs are destroyed, many marine food chains will be destroyed. ( )
4. Vinegar and frozen vegetables have definite shape. ( )

**(B) What happens if ...?**

A magnet is put close to an iron nail and a plastic spoon.

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**2 (A) Complete the following sentences using these words :**

(overfishing – shelter – toxic – predator)

1. Healthy natural resources include clean air, healthy food, water and suitable ...............
2. The human activity that directly decreases the marine population is known as ...............
3. When a sea turtle eats a jellyfish, this means that the sea turtle is a .............. living organism.
4. Plastic waste materials are very harmful to marine organisms, because they are .............. and sharp.

**(B) Correct the underlined words :**

1. There are tiny holes on the <u>stem</u> to allow gases passes into the plant. (.........................)
2. Plant's <u>leaves</u> help it to be fixed in the soil. (.........................)

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**3 (A) Write the scientific term of each of the following :**

1. It is a process by which a matter is changed from solid state to liquid state. (.........................)
2. The property of matter which is measured by the measuring cup. (.........................)
3. A model of the whole world that is made in the shape of a large ball. (.........................)
4. They are consumers which feed on secondary consumers. (.........................)

**(B) Give a reason for the following :**

Ice is turned into water when it is placed in a warm room.

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# Model Exam 4

**1 (A) Write the scientific term of each of the following :**

1. The process of producing new plants. (..........................)
2. A group of living organisms that can produce their own food. (..........................)
3. Flying living organisms that build their nests on the top of mountain cliffs and dive deeply into the sea to eat. (..........................)
4. The state of matter that has definite volume and shape. (..........................)

**(B) Give a reason for the following :**

Balloons and blimps filled with helium always rise up in the air.

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**2 (A) Put (✓) or (✗) :**

1. Healthy habitats provide living organisms with clean air, healthy food and water. ( )
2. When particles of a matter absorb thermal energy, they move slower. ( )
3. Recycling nutrients back to the ecosystem is the main function of the consumers. ( )
4. From the chemical properties of helium is that it is not flammable. ( )

**(B) What happens if ...?**

Plants have no stems.

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**3 (A) Choose the correct answer :**

1. When the plant seed begins to grow and makes sprouts, this process is called ..............
   a. respiration. b. germination. c. absorption. d. reproduction.
2. Decomposers always .............. the soil.
   a. pollute b. damage c. benefit d. harm
3. The marine food web usually starts with ..............
   a. clam. b. algae. c. zooplankton. d. parrotfish.
4. We can use a model to study very large things such as ..............
   a. solar system. b. germs. c. microbes. d. viruses.

**(B) Look at the opposite figure, then put (✓) or (✗) :**

1. Label ① refers to a matter in liquid state. ( )
2. Label ② refers to a matter in solid state. ( )
3. Label ③ refers to a matter that its shape and volume don't change. ( )
4. Particles of matter ① move slower than particles of matter ③. ( )

# Model Exam 5

**1 (A) Choose the correct answer :**

1. The volume of one liter of water has a mass of ...............
   a. one gram. b. one kilogram.
   c. one milliliter. d. one cubic centimeter.
2. When the water is heated, its particles ...............
   a. move slower. b. move faster.
   c. move with the same speed. d. do not move.
3. Salt can be separated by ............... of salty water.
   a. melting b. evaporation c. freezing d. condensation
4. In plant's leaves, light energy of the Sun is converted into ............... energy during photosynthesis process.
   a. sound b. electric c. chemical d. kinetic

**(B) Study the following figures that represent particles of three states of matter, then put (✓) or (✗) :**

Figure (1) Figure (2) Figure (3)

1. Figure (1) represents solid matter. ( )
2. Figure (2) represents liquid matter. ( )
3. By increasing the spaces between the particles of figure (2), it will change into solid state. ( )
4. Particles of figure (1) have more energy than particles of figure (3). ( )

**2** **(A) Complete the following sentences :**

1. An area that provides food, water and shelter to all living organisms which live in it, is known as ..............
2. According to temperature, matter can be classified into .............. and .............. objects.
3. Helium is not .............. or .............. , so it is considered as a safe gas.
4. Without .............. in the leaves of plants, gases can't move in or out of the plant.

**(B) Give a reason for the following :**

When the temperature of ice cubes increases, they will melt.

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**3** **(A) Write the scientific term of each of the following :**

1. They are changes in matter which are usually reversible and don't affect its structure. (..........................)
2. It is the process by which matter changes from liquid state to gas state. (..........................)
3. A tool used to measure the length of wall. (..........................)
4. They are consumers that exist at the top of food chains. (..........................)

**(B) What happens if ...?**

Plant's leaves don't contain chlorophyll.

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## Model Exam 6

**1** **(A) Complete the following sentences :**

1. The food of plant is a type of .............. which is made in their .............. by photosynthesis process.
2. Sunlight energy converts .............. and .............. into glucose inside the plant's leaves.
3. Bacteria and fungi are considered as .............. organisms, while rabbits are considered as .............. organisms.
4. Particles of .............. matter can slide over each other, so they take the .............. of their containers.

**(B) Give a reason for the following :**

The roof of tropical rainforest home is made of leaves and sticks.

................................................................................................................................

**2** **(A) Choose the correct answer :**

1. Which of the following matter has a definite volume and shape ? ..............
   a. Water. b. Milk. c. Ice. d. Air.
2. In the presence of water, seeds can germinate at the beginning of growth without the need of ..............
   a. soil. b. rocks. c. insects. d. dry paper towel.
3. Which of the following living organisms can make their own food ? ..............
   a. Hawks. b. Mice. c. Pine trees. d. Caracals.
4. If all grasses were removed completely from an ecosystem, rabbits in this ecosystem will ..............
   a. increase. b. decrease. c. die. d. not be affected.

**(B) Choose from column (B) what suits it in column (A) :**

| (A) | (B) |
|---|---|
| 1. Photosynthesis process<br>2. Respiration process<br>3. Decomposition process | a. it produces nutrients which are important for soil fertility.<br>b. it produces light which is important for plants.<br>c. it produces oxygen gas which is important for breathing.<br>d. it produces carbon dioxide gas which is important for plants. |

1. .............. 2. .............. 3. ..............

**3** **(A) Put (✓) or (✗) :**

1. We can differentiate between sugar and flour by texture. ( )
2. When a solid matter gains thermal energy, it will change into liquid state. ( )
3. Plants and humans are similar in the way of getting food. ( )
4. Human can eat plants and animals. ( )

**(B) What happens to ...?**

The microorganisms if the seawater becomes warm.

..........................................................................................................................

## Model Exam 7

**1** **(A) Write the scientific term of each of the following :**

1. A human activity that leads to decreasing the number of fish and affecting many marine food webs. (........................)
2. The gas that is produced from photosynthesis process. (........................)

3. A system of tubes through which water, nutrients and plant food are carried all over the plant. (.........................)
4. A property of matter by which we can distinguish between hot and cold objects. (.........................)

**(B) What happens to ...?**

The temperature of a matter if the speed of its particles decreases.

..........................................................................................................................................

**2** **(A) Put (✓) or (✗) :**

1. We can use thermometer to measure the temperature of a hot cup of tea. (     )
2. If we increase the temperature of some pieces of ice, they will melt. (     )
3. Photosynthesis process takes place in the plant roots. (     )
4. The first link in any food chain is a consumer. (     )

**(B) Give a reason for the following :**

Chlorophyll in plant's leaves has an important role in photosynthesis process.

..........................................................................................................................................

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**3** **(A) Choose the correct answer :**

1. All of the following materials can reach the plant's leaves, except ..............
   a. nutrients. b. carbon dioxide gas.
   c. water. d. soil.
2. A snake is a predator for mice, while snake is considered as a prey for ..............
   a. rabbit. b. frog. c. eagle. d. deer.
3. Which of the following two living organisms don't have direct food relationship between them ? ..............
   a. Parrotfish and shark. b. Butterflyfish and shark.
   c. Triggerfish and shark. d. Eagle and shark.
4. Oil takes the .............. of its container.
   a. volume b. shape c. color d. mass

**(B) Look at the opposite figures that represent the three states of matter, then complete the following sentences :**

1. Matter in figure ................. takes the shape of its container but its volume doesn't change.
2. Particles of figure ................. move faster than that of figure ................. and figure .................
3. Particles of figure ................. are not held together.

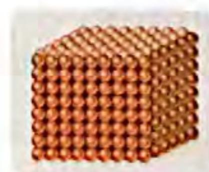

Figure (A)


Figure (B)


Figure (C)

# Model Exam 8

## 1 (A) Put (✓) or (✗) :

1. Phloem transports food materials from the leaves to the other parts of the plant. ( )
2. In an ecosystem that contains rabbits, mice, eagles and snakes only, if snakes disappear completely, so eagles will disappear completely. ( )
3. A desert food chain doesn't contain any type of fish. ( )
4. A model of an airplane shows us how it flies up into the air. ( )

**(B) Give a reason for the following :**

Human can use helium gas safely.

............................................................................................................................

## 2 (A) Choose the correct answer :

1. Condensation changes the matter from ............... state to ............... state.
   a. solid – liquid b. liquid – gas c. gas – liquid d. liquid – solid
2. The green plants can make their own food through ...............
   a. roots. b. leaves. c. stems. d. flowers.
3. Any food chain starts with ...............
   a. insects. b. plants. c. fungi. d. bacteria.
4. If the climate change is suitable, the population of a species will ...............
   a. increase. b. decrease. c. die. d. not be affected.

**(B) What happens to ...?**

The speed of the particles of a liquid if it changes into gas.

............................................................................................................................

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## 3 (A) Complete the following sentences using the words below :

(solid – liquid – gas – space – particles)

1. The state of matter that has a definite volume, but it doesn't have a definite shape is ............... state.
2. Volume is the amount of ............... that matter takes up.
3. We can classify the states of matter into liquid, ............... and ...............
4. Matter is made up of tiny ...............

**(B) Choose from column (B) what suits it in column (A) :**

| (A) | (B) |
|---|---|
| 1. Carbon dioxide | a. is a solid matter. |
| 2. Sand | b. is a liquid matter. |
| | c. is needed for photosynthesis process. |

1. ............... 2. ...............

# Model Exam 9

**1 (A) Choose the correct answer :**

1. We can measure the volume of a liquid by all the following units except ..............
   a. kilogram. b. milliliters.
   c. cubic centimeters. d. liters.
2. Among chemical changes which is occurred in cooking is ..............
   a. cutting vegetables. b. boiling of water.
   c. melting of chocolate. d. baking a bread.
3. The kind of stems that extend underground are called .............. stems.
   a. climb b. tuber c. runner d. wood
4. Many insects are considered as ..............
   a. producers. b. decomposers.
   c. primary consumers. d. secondary consumers.

**(B) What happens if ...?**

A small lake is exposed to extreme hot climate for several months.

..............................................................................................................

**2 (A) Complete the following sentences by using the words below :**

(chemical – physical – rough – odor)

1. Both of odor and texture of matter are considered from the .............. properties of matter.
2. You can identify the .............. of a juice by using the sense of smell.
3. We can describe the texture of sugar crystals by saying "it has .............. crystal texture".
4. The ability of a piece of iron to rust is from the .............. properties of matter.

**(B) Give a reason for the following :**

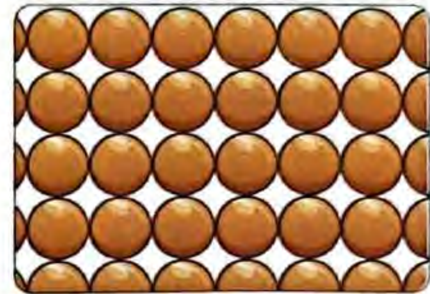
Both melting and freezing processes are considered as physical changes.

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**3 (A) Put (✓) or (✗) :**

1. Plant's stem has hairs that absorb oxygen gas from the air. ( )
2. Birds are secondary consumers, because they eat insects that feed on plants. ( )
3. Microorganisms are producers that small fish feed on to get energy. ( )
4. The speed of water vapor particles is greater than that of water particles. ( )

**(B) Look at the opposite model of balls that shows the particles of a matter, then complete the following sentences :**



1. This model represents a matter in ................. state.
2. If we want to make changes in this model to show this matter in a liquid state, we should ................. the distances between balls.

## Model Exam 10

**1 (A) Put (✓) or (✗) :**

1. Light is important for plant growth. (  )
2. Water and carbon dioxide are absorbed by plant's roots to help the plant to grow. (  )
3. Light and sound are forms of matter. (  )
4. Liquids don't take the shape of the container that they are placed in. (  )

**(B) Correct the underlined words :**

1. Humans can get their food from air and animals. (........................)
2. Oxygen gas is absorbed by plant's leaves to make photosynthesis process. (........................)

**2 (A) Write the scientific term of each of the following :**

1. A device used to examine one tiny particle such as a blood cell. (........................)
2. The state of water when its temperature is located between 0°C and 100°C. (........................)
3. The process by which the plant can make its own food. (........................)
4. Parts of the plant that are responsible for reproduction. (........................)

**(B) Give a reason for the following :**

Wood has definite shape and volume.

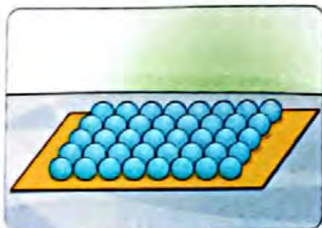
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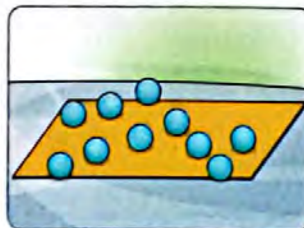
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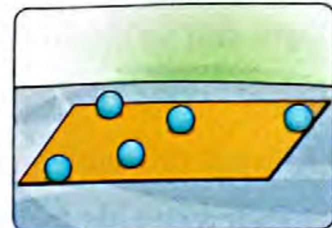
**3 (A) Choose the correct answer :**

1. We can measure the mass of a cube of ice by using a ..............
   a. thermometer. b. ruler.
   c. measuring tape. d. balance.
2. We can identify milk by determining its ..............
   a. color and texture. b. shape and odor.
   c. color and taste. d. color and size.
3. To separate sand only from salty water, we can use .............. process.
   a. filtration b. evaporation c. melting d. freezing
4. Blood rich in carbon dioxide gas returns back to the heart through ..............
   a. arteries. b. veins. c. lungs. d. xylem.

**(B) The following figures show three models of particles of some matter related to our planet Earth, complete the following sentences :**


Figure (1)


Figure (2)


Figure (3)

1. Beads of figure ................ could represent the particles of a rock on Earth's surface.
2. Beads of figure ................ could represent the particles of river water on Earth.



# Final Examinations of some governorates on the first term 2023

## 1 Cairo Governorate — Heliopolis Educational Administration

**1 (A) Choose the correct answer from the following :**

1. The measuring unit of volume ..............
   a. cm. b. $cm^3$. c. Kg. d. gram.
2. Particles of .............. are very close to each other.
   a. glass b. air c. oxygen d. water
3. If the amount of grass increases on ecosystem, this directly increases the number of ..............
   a. hawks. b. lions. c. caracals. d. rabbits.
4. Plants need .............. and .............. from the air that help them make photosynthesis process.
   a. sunlight – carbon dioxide b. sunlight – oxygen
   c. oxygen – nutrients d. oxygen – water

**(B) Mention the importance of roots for plants.**

..............................................................................................................

**2 (A) Complete the following sentences :**

1. We can use .............. gas to fill blimps because it is .............. than air.
2. Sea .............. cannot differentiate between a jellyfish and a piece of .............. in the water.
3. Veins carry blood that contains .............. from the body parts to ..............
4. Changing water from solid state to liquid state by heating called .............. while changing water from gaseous state to liquid state is called ..............

**(B) Write the scientific term :**

It is the number of organisms of one type of species living in an area. (......................)

**3 (A) Put (✓) or (✗) :**

1. Desalination process is the process of removing salt from water by cooling only. ( )
2. Burr seeds are spiny, so they can stick to animal fur. ( )
3. By decreasing the temperature of matter, the speed of its particles will increase. ( )
4. The mass of an iron bar its volume is 100 $cm^3$ equals to the mass of wooden bar has the same volume. ( )

**(B) Cross out the odd word and name the group :**

Mouse – Eagle – Grass – Snake.

1. The odd word : ..............................................................
2. The group : ..............................................................

## 2 Cairo Governorate — Al Khalifa and Al Mokattam Directorate

**1** **(A) Complete the following sentences :**

1. ............... is a gas produced during photosynthesis process.
2. ............... can eat plants and animals.
3. Bacteria and fungi are two examples of ...............
4. An example of liquid is ...............

**(B) Write the scientific term :**

Process in which the matter changes from solid state to liquid state by heating. (.........................)

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**2** **(A) Choose the correct answer from the following :**

1. Oil takes the ............... of its container.
   a. shape  b. color  c. mass
2. Steel is used in making hammers because it is ...............
   a. flexible.  b. transparent.  c. hard.
3. Ice can turn into water by ...............
   a. heating.  b. rusting.  c. freezing.
4. Among examples of physical changes is ...............
   a. burning of wood.  b. rusting of iron.  c. cutting a paper.

**(B) Give a reason for :**

Iron and wood are solid state of matter.

.................................................................................................................................

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**3** **(A) Put (✓) or (X) :**

1. Roots fix the plant in the soil. (   )
2. Any food chain starts with bacteria. (   )
3. All matter are made up of tiny particles. (   )
4. Thermometer is used to measure the length of a book. (   )

**(B) Cross out the odd word :**

Wood – Iron – Oxygen – Gold. (.........................)

## 3 Cairo Governorate — New Cairo Administration Capital School

**1 (A) Complete the following sentences :**

1. When ice is melted it changed from .............. state to .............. state.
2. There are three types of vessels in the human circulatory system which are .............. , .............. and blood capillaries.
3. Plants produce .............. and .............. during photosynthesis process.
4. .............. and .............. take the shape of their containers.

**(B) Give a reason for :**

Chlorophyll in plant's leaves has an important role in photosynthesis process.

..............................................................................................................................

**2 (A) Write the scientific term of each of the following :**

1. They are consumers which feed on secondary consumers. (........................)
2. Anything that has a mass and takes up a space. (........................)
3. The tool used to measure the length of a wall. (........................)
4. A part of the plant that carries water and nutrients from the roots to the leaves. (........................)

**(B) Form a food chain using these organisms :**

(Rabbit – Snake – Hawk – Grass)

........................ → ........................ → ........................ → ........................

**3 (A) Choose the correct answer from the following :**

1. If all grasses were removed completely from an ecosystem, rabbits in this ecosystem will ..............
   a. increase. b. decrease. c. die. d. not be affected.
2. To examine the structure of tiny particles of a matter, we can use ..............
   a. thermometer. b. balance. c. ruler. d. microscope.
3. Maple seeds travel by wind, because they are .............. seeds.
   a. light b. spiny c. heavy d. smooth
4. Particles of .............. are very close to each other.
   a. milk b. steam c. gold d. oxygen

**(B) What happens if ... ?**

A plant is placed in a dark place for many days.

..............................................................................................................................

## 4 Cairo Governorate — Shubra Educational Directorate

**1 (A) Complete the following sentences using the words below :**

(phloem – primary consumers – measuring cup – melting)

1. We can change ice into water by using ............... process.
2. ............... is used to determine the volume of an amount of water.
3. The tubes that carry food from leaves to all the plant parts are called ...............
4. Humans can eat producers and ...............

**(B) Classify the following items :**

**(Sunlight – Soil)**

| Basic plant need for photosynthesis | Not basic plant need for photosynthesis |
|---|---|
| ............................................................ | ............................................................ |

**2 (A) Choose the correct answer from the following :**

1. Flowers produce ............... for reproduction.
   a. leaves b. stems c. seeds d. roots
2. The used material in making the body of cooking pans is ...............
   a. copper. b. glass. c. wood. d. helium.
3. To separate sand from water, we can use ............... process.
   a. filtration b. evaporation c. melting d. freezing
4. Living organisms that decay dead organisms are called ...............
   a. producers. b. primary consumers.
   c. decomposers. d. preys.

**(B) Give a reason for :**

Photosynthesis process is important for plants to survive.

..........................................................................................................................................

**3 (A) Put (✓) or (✗) :**

1. Volume is the space that is taken by a matter. ( )
2. Chlorophyll in plant's root absorbs sunlight. ( )
3. Ice and gold are examples of solid state of matter. ( )
4. Veins carry blood rich in oxygen and nutrients. ( )

**(B) Form a food chain by using the following living organisms :**

(Coral – Zooplankton – Shark – Algae – Parrotfish)

..........................................................................................................................................

## 5 Giza Governorate — El Dokki Educational Directorate

**1 (A) Choose the correct answer from the following :**

1. Plants use .............. during photosynthesis process.
   a. nitrogen b. oxygen c. carbon dioxide d. sugar
2. Water takes the .............. of its container.
   a. mass b. shape c. color d. volume
3. Any food chain starts with ..............
   a. consumer. b. producer. c. fungi. d. decomposers.
4. Steel is used in making hammers, because it is ..............
   a. flexible. b. smooth. c. hard. d. transparent.

**(B) Form a food chain by using the following organisms :**

(Frog – Grass – Snake – Grasshopper – Hawk)

.......................................................................................................................

.......................................................................................................................

**2 (A) Complete the following sentences using the words below :**

(physical – overfishing – shelter – chemical)

1. Iron rusting is from the .............. changes of matter.
2. .............. is from human activity that harm marine ecosystem.
3. Odor and texture are from .............. properties of matter.
4. .............. is a healthy natural area include clean air, food and water.

**(B) Mention the method of seed dispersal of the following :**

1. Dandelion seeds. 2. Coconut seeds.

.......................................................................................................................

.......................................................................................................................

**3 (A) Put (✓) or (✗) :**

1. Phloem transports glucose from the leaves to the other parts of the plant. (  )
2. All living organisms need energy. (  )
3. Producers need consumers to live and grow. (  )
4. If coral reefs are destroyed, many marine food chains will be destroyed. (  )

**(B) Cross out the odd word :**

1. Carbon dioxide gas – Sunlight – Water – Oxygen gas. (........................)
2. Wood – Iron – Oxygen – Plastic. (........................)

## 6 Giza Governorate — Experimental Directorate Official Lang. Schools

**1 (A) Put (✓) or (✗) :**

1. Green plants can grow well in a dark room. ( )
2. Food chains start with decomposers. ( )
3. Liquid particles move faster than solid particles. ( )
4. Ice is considered the solid state of matter. ( )

**(B) Give a reason for :**

Xylem vessels are important for the plant.

..........................................................................................................................................

**2 (A) Choose the correct answer from the following :**

1. To see the components of one blood cell, we need ..............
   a. electron microscope. b. scale.
   c. measuring tape. d. balance.
2. .............. are pores on the surface of plant's leaves that allow gases to move into and out of the plant.
   a. Stomata b. Xylem c. Phloem d. Hairs
3. The suitable habitat for microorganisms to survive is ..............
   a. hot water. b. warm water. c. cold water. d. boiled water.
4. An example of a gas is ..............
   a. chocolate b. rock. c. pencil. d. oxygen.

**(B) Cross out the odd word :**

Pine trees – Apple trees – House flies – Grasses. (........................)

**3 (A) Choose from column (B) what suits it in column (A) :**

| (A) | (B) |
|---|---|
| 1. Veins | a. floating on water. |
| 2. Coconut seeds | b. carry carbon dioxide gas from the body parts to the heart. |
| 3. Physical changes | c. used to build roofs of cold weather homes. |
| 4. Ceramic tiles | d. are the changes in matter which are usually reversible and don't affect its structure. |

1. .............. 2. .............. 3. .............. 4. ..............

**(B) What happens when ...?**

We put a seed of bean in wet soil for many days.

..........................................................................................................................................

## 7 Alexandria Governorate — El Agami Educational Zone

**1 (A) Choose the correct answer from the following :**

1. Food moves from the leaves to the other parts of the plant through .............. tubes.
   a. stomata b. roots. c. phloem d. xylem
2. The final link in any food chain is the ..............
   a. consumer. b. producer. c. decomposer. d. food web.
3. Which of the following particles are very close together ? ..............
   a. Oxygen gas. b. Water. c. Oil. d. Wood.
4. The .............. is used to make electrical wires due to its properties.
   a. glass b. wood c. helium d. copper

**(B) Give a reason for :**

Snakes are secondary consumers.

..........................................................................................................................................

..........................................................................................................................................

---

**2 (A) Put (✓) or (✗) :**

1. Blood moves only in one direction in human's veins or arteries. ( )
2. Chemical changes as rusting of iron can be reversed easily. ( )
3. Food and oxygen provide the body with the energy needed. ( )
4. When the matter gain more energy, it can change to different states. ( )

**(B) What happens to ...?**

The eagles if the grasses were removed from an area.

..........................................................................................................................................

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---

**3 (A) Complete the following sentences :**

1. Trees and other plants make food through .............. process.
2. You can separate the mixture of .............. by evaporation.
3. Flowers are the .............. parts of many plants.
4. Bacteria and fungi are examples of ..............

**(B) What is the importance of microorganisms in the marine ecosystem ?**

..........................................................................................................................................

..........................................................................................................................................

## 8 Menofia Governorate — Sheben El-Koum Educational Zone

**1 (A) Complete the following sentences :**

1. In plant's leaves, .............. energy of the Sun changes into .............. energy.
2. Bacteria and .............. are from .............. living organisms that break down dead organisms.
3. Water is the matter in .............. state, while water vapor is the matter in .............. state.
4. We can separate sand from water by .............. process, and salt from water by .............. process.

**(B) What happens if ...?**

We remove the flowers of a plant.

..............................................................................................................................

**2 (A) Choose the correct answer from the following :**

1. The gas that is produced from photosynthesis process is ..............
   a. carbon dioxide. b. oxygen. c. nitrogen. d. hydrogen.
2. The marine food web usually starts with ..............
   a. clam. b. zooplankton. c. algae. d. parrotfish.
3. Particles of .............. are very close to each other.
   a. oxygen b. steam c. milk d. gold
4. Burning of fuel in cars is considered as .............. change of matter
   a. chemical b. physical
   c. physical and chemical d. biological

**(B) Give a reason for :**

Circulatory system has an important role for human to survive.

..............................................................................................................................

**3 (A) Put (✓) or (✗) :**

1. There is no interaction between the components of an ecosystem ( )
2. Most of the energy in a food web transfers between living organisms when an organism feeds on the other. ( )
3. Helium takes the shape and the volume of its container. ( )
4. Desalination process contain filtration process only. ( )

**(B) From this food chain (Grass ⟶ Mouse ⟶ Snake ⟶ Eagle), answer the following :**

The mouse is called .............., but the eagle is called .............. (write their types).

## 9 Dakahlia Governorate — Science Inspectorate

**1 (A) Choose the correct answer from the following :**

1. The .............. of the plant absorb water and nutrients from the soil.
   a. stems b. leaves c. flowers d. roots
2. .............. carry blood that is rich in oxygen and glucose from the heart to the body cells.
   a. Veins b. Lungs c. Arteries d. Lungs and veins
3. Ice can turn into water by ..............
   a. heating. b. freezing. c. cooling. d. evaporation.
4. In a food chain the energy transfers from ..............
   a. a predator to a prey. b. a prey to a predator.
   c. a predator to a producer. d. a consumer to a producer.

**(B) Form a food chain using the following organisms :**

(Hawk – Snake – Insect – Grass – Frog)

..............................................................................................................

**2 (A) Put (✓) or (✗) :**

1. Rusting of iron is a physical change. ( )
2. If the masses of two different materials are equal, so their volume must be equal. ( )
3. Xylem is important for plants to transfer water from plants roots to leaves. ( )
4. Coral reefs bleaching occurs when the temperature of seawater decreases. ( )

**(B) What happens to ... ?**

The solid matter particles if it is heated.

..............................................................................................................

**3 (A) Complete the following sentences using the words below :**

(tubers – habitats – decomposers – microorganisms – seed dispersal – ecosystem)

1. Traveling by wind and floating on water are from ways of ..............
2. .............. are organisms that decay dead animals and plants.
3. The potato stems extend underground and called ..............
4. .............. are the producers in the marine food web.

**(B) How can you separate the salt from salty water mixture ?**

..............................................................................................................

## 10 Gharbia Governorate — Samanoud Educational Zone

**1 (A) Choose the correct answer from the following :**

1. All the following happen to the particles of oil when it is cooled, except that they ..............
   a. move slower. b. move faster. c. vibrate less. d. come close together.
2. The physical property of milk that you can see is the .............. of it.
   a. odor b. texture c. color d. taste
3. Glucose sugar is transported from the leaves to all parts of the plant through ..............
   a. chlorophyll. b. stomata. c. xylem. d. phloem.
4. Organisms that break down dead animals and plants are called ..............
   a. decomposers. b. consumers. c. preys. d. producers.

**(B) Mention two methods of seed dispersal.**

..............................................................................................................................

..............................................................................................................................

**2 (A) Put (✓) or (✗) :**

1. Handles of cooking pans are made up of wood or plastic. ( )
2. The roof of desert home is similar to rainforest home. ( )
3. Food web shows interaction between many living organisms. ( )
4. Producers form their own food, while decomposers return nutrients back to the ecosystem. ( )

**(B) Give a reason for :**

Oxygen has no definite shape or volume.

..............................................................................................................................

**3 (A) Complete the following statements :**

1. Mixing baking soda with vinegar is an example of .............. changes.
2. The plants leaves have tiny openings called ..............
3. Microorganisms are found in .............. water habitats.
4. .............. is a copy that is similar to real thing that shows what it looks like or work like.

**(B) What happens to ... ?**

The coral reefs when the seawater temperature rises.

..............................................................................................................................

## 11 Damietta Governorate — New Damietta Educational Zone

**1 (A) Choose the correct answer from the following :**

1. Decomposers always .............. the soil.
   a. pollute  b. damage  c. benefit  d. harm
2. Salt can be separated by .............. of salty water.
   a. melting  b. evaporation  c. freezing  d. condensation
3. In plants leaves, light energy of the Sun is converted into .............. energy during photosynthesis process.
   a. sound  b. electric  c. chemical  d. kinetic
4. When water is heated, its particles ..............
   a. move slower.  b. move faster.
   c. move with same speed.  d. don't move.

**(B) Give a reason for :**

Producers depend on light energy of the Sun to grow.

..............................................................................................................

**2 (A) Put (✓) or (✗) :**

1. Plants stems absorb oxygen gas from the air ( )
2. Light and sound are forms of matter. ( )
3. The first link in any food chain is a consumer. ( )
4. Iron spoon is attracted to the magnet. ( )

**(B) What happens if ...?**

Plants leaves don't contain chlorophyll.

..............................................................................................................

**3 (A) Write the scientific term of each of the following :**

1. A tool that is used to measure the length of a wall. (..........................)
2. They are changes in matter which don't affect its structure. (..........................)
3. The gas that is produced from photosynthesis process. (..........................)
4. They are organisms that break down dead organisms bodies. (..........................)

**(B) Study the following food chain, then complete :**

Grasses ⟶ Grasshoppers ⟶ Birds ⟶ Snakes ⟶ Hawks

The .......................... are secondary consumers, because ..........................

## 12 Ismailia Governorate — Science Inspectorate

**1 (A) Complete the following sentences :**

1. In plants, .............. are responsible for absorption of water and nutrients from the soil.
2. You can measure the volume of a matter by using ..............
3. When particles of a matter gain thermal energy, their motion become ..............
4. The .............. system transports nutrients and oxygen to cells and organs in human.

**(B) Give a reason for :**

Chlorophyll in plant leaves is very important in photosynthesis process.

..........................................................................................................................................

**2 (A) Write the scientific term of each of the following :**

1. It is the amount of space that matter takes up. (........................)
2. The non poisonous gas that is used in filling balloons. (........................)
3. Tiny openings on the surface of plant's leaves that allow gases move into and out of the plant. (........................)
4. The gas that the plant needs to make photosynthesis process. (........................)

**(B) What happens to ...?**

The coral reefs when water becomes very warm.

..........................................................................................................................................

**3 (A) Choose the correct answer from the following :**

1. All of the following are physical properties of matter except ..............
   a. color. b. shape. c. rust. d. texture.
2. Which of the following matter its particles are very close together ? ..............
   a. Air. b. Water. c. Oil. d. Wood.
3. Glucose sugar is transported from leaves to other parts of the plant through ..............
   a. phloem. b. xylem. c. stem. d. roots.
4. Potato plant has .............. stem.
   a. upright b. climb c. tuber d. runner

**(B) Form a food chain by using the following organisms :**

(Rat – Grass – Hawk – Snake)

..........................................................................................................................................

## 13 Beni Suef Governorate — Official Language Schools Directorate

**1 (A) Choose the correct answer from the following :**

1. The green plants can make their own food through ..............
   a. roots. b. leaves. c. stems. d. flowers.
2. Any food chain starts with ..............
   a. Insects. b. fungi. c. plants. d. bacteria.
3. If the climate change is suitable, the population of a species will ..............
   a. increase. b. decrease. c. die. d. not be affected.
4. Steel is used in making hammers, because it is ..............
   a. flexible b. smooth. c. hard. d. transparent.

**(B) What happens if ...?**

A plant is placed in a dark place for many days.

..........................................................................................................................

**2 (A) Put (✓) or (✗) :**

1. If we increase the temperature of ice, it will melt. ( )
2. Healthy habitats provide living organisms with clean air, healthy food and water. ( )
3. Human can eat plants and animals. ( )
4. Gram is the measuring unit of mass. ( )

**(B) Cross out the odd word :**

Wood – Iron – Oxygen – Plastic. (........................)

**3 (A) Complete the following sentences using these words :**

(stomata – liquid – evaporation – chemical)

1. The ability of a piece of iron to rust is from the .............. properties of the matter.
2. Salt can be separated by .............. of salty water.
3. Without .............. in the leaves of plants, gases can't move into or out of the plant.
4. The state of matter that has a definite volume, but it doesn't have a definite shape is .............. state.

**(B) Correct the underlined word :**

Oxygen gas is absorbed by plant's leaves to make photosynthesis process.

(........................)

## 14 Minia Governorate — Matay Educational Zone

### 1 (A) Choose the correct answer from the following :

1. The plant can make its own food during a process called ..............
   a. reproduction. b. seed dispersal.
   c. photosynthesis. d. respiration.
2. The food chain starts with .............. living organisms.
   a. producers b. consumers c. decomposers d. predators
3. A state of matter that has definite shape and definite volume is ..............
   a. solid. b. liquid. c. gas. d. all the previous.
4. When corals .............. the seawater, they may ingest microplastics.
   a. evaporate b. filter c. cool d. warm

**(B) Rearrange the following living organisms to form a food chain :**

(Hawk – Grass – Snake – Rat)

..........................................................................................................................

### 2 (A) Put (✓) or (X) :

1. Stomata allow gases to move into and out of the plant. ( )
2. Coconut seeds disperse by wind. ( )
3. The matter can be changed from state to another by changing its temperature. ( )
4. Water pollution doesn't affect food chains in the ecosystem. ( )

**(B) What happens when ...?**

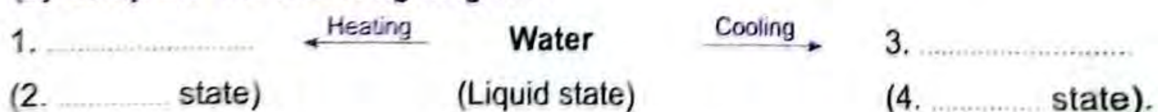
The water temperature rises for coral reefs.

..........................................................................................................................

### 3 (A) Complete using words between two brackets :

1. Wood .............. in/on the water. (sinks – floats)
2. Two or more interconnected food chains is called .............. (food web – ecosystem)
3. Anything has a mass and takes up space is .............. (energy – matter)
4. From properties of glass is that it is .............. (opaque – transparent)

**(B) Complete the following diagram :**



## 15 Assiut Governorate — Science Inspectorate

**1 (A) Complete the following sentences, using the words below :**

(organisms – particles – 0°C – imbalance – 100°C)

1. When a drought occurs in a lake, it causes .............. in ecosystem.
2. All matter is made up of tiny ..............
3. The freezing point of water is ..............
4. All .............. need a source of energy.

**(B) Write the scientific term :**

It is the final link in a food chain. (..........................)

---

**2 (A) Put (✓) or (✗) :**

1. Metal rusts due to chemical changes that occur to the material. ( )
2. Coral bleaching has a positive impact on coral reefs. ( )
3. Cutting wood into pieces changes its mass and color. ( )
4. A flower is a reproductive part of the plant. ( )

**(B) Mention two methods of seed dispersal :**

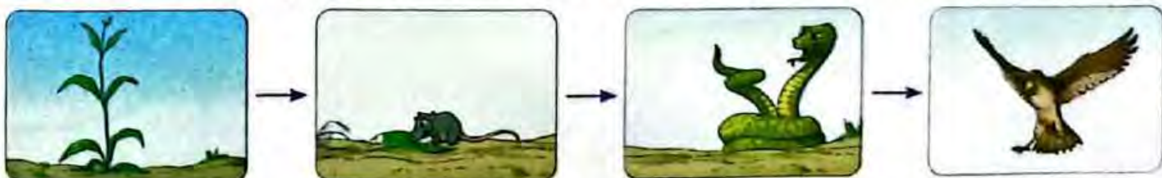
1. ......................... 2. .........................

---

**3 (A) Choose the correct answer from the following :**

1. .............. is the solid state of water.
   a. Water b. Ice c. Steam d. Water vapor
2. All the following factors pollute the water, except ..............
   a. plastic garbage. b. animals wastes.
   c. sunlight. d. human wastes.
3. The plant needs air in the photosynthesis process using ..............
   a. root. b. xylem. c. phloem. d. stomata.
4. The measuring unit of mass is ..............
   a. liter. b. gram. c. cm. d. ml.

**(B) Study the following figure, then complete the following sentences :**

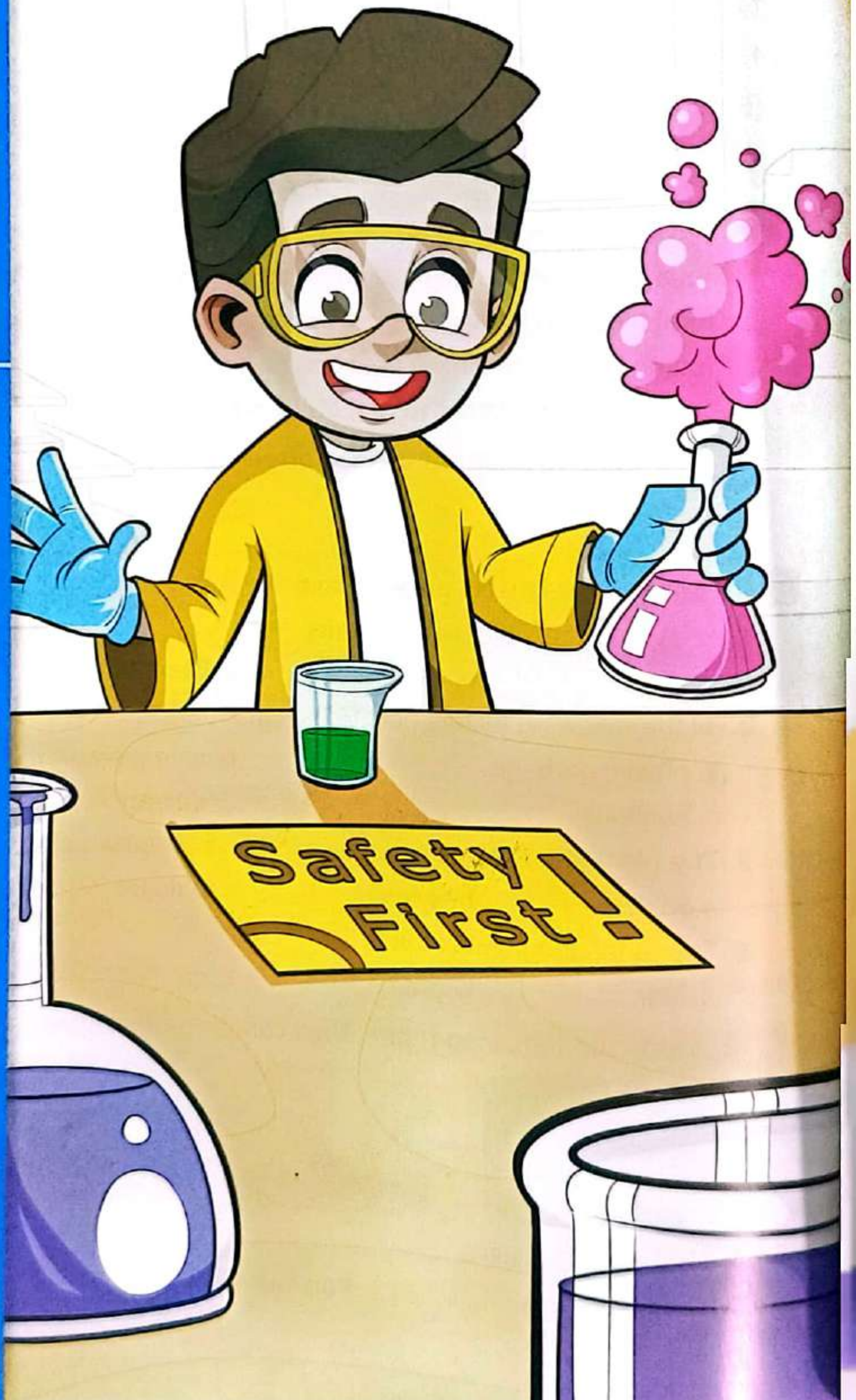


1. This model is called .........................
2. The snake is a ......................... that eats mouse.

# 4
# PART

## Projects :

- Unit One Project.
- Interdisciplinary Project.
- Unit Two Project.



UNIT ONE **Project**

## Build a Miniature Ecosystem

- In this project, you will build a "Miniature Ecosystem" which means a very small ecosystem using simple tools and materials.
- Your miniature ecosystem will include some nonliving things and also some different living organisms that represent producers, consumers and decomposers to show how energy transfers among living organisms in an ecosystem.

**Note**

In your miniature ecosystem, you have to get real living Beetles and Earthworms that you may find in gardens or your surrounding environment, also you can buy them from pets shops.

**Materials**


Large plastic bottle


Scissors


Soil


Water


Bean seeds


Beetles


Earthworms


Dead leaves


2 Rubber bands


Small piece of cloth


Piece of cloth with small holes

## Steps

1. Cut the plastic bottle into two halves using the scissors as shown.



2. Cover the opening of the upper part of the bottle with the small piece of cloth and fix it tightly with a rubber band.



3. Pour some water in the lower part of the bottle.



4. Invert the upper part of the bottle into the lower part as shown (the water should cover the piece of cloth).



5. Put some soil in the upper part of the bottle and plant the bean seeds in it, then put the project in a sunny place.



6. When the bean seeds begin to grow, add the dead leaves, earthworms, and beetles to the upper part of the bottle.



7. Close the upper part of the bottle using the piece of cloth with small holes and fix it tightly with a rubber band.



▶ **Now, you have made your miniature ecosystem that contains different living organisms and nonliving things, where :**

- Soil and water are nonliving things.
- Bean plants represent producer organisms.
- Beetles represent consumer organisms.
- Earthworms represent decomposer organisms.
- Dead leaves represent dead organisms.

## INTERDISCIPLINARY Project

### Waste Not, Want Not

▸ Plastic is a common material that we always use in our lives in many purposes such as :

- Packing and storing our food.
- Transporting water.
- Manufacturing some medical tools.



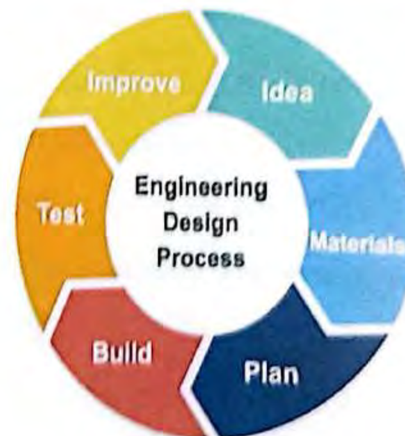
▸ However, much of the plastic we use are thrown away. Plastic bags and water bottles are the most items that people throw into the environment.

▸ As you have learned that plastic is one of the most harmful waste because it is especially dangerous to animals, for example :
In the River Nile, scientists have found that most of fish have swallowed plastic caused by human pollution and this leads to death of fish.



▸ Humans try to decrease the bad effects of plastic on the environment in different ways, such as :

– Collecting plastic trash along the shore.
– Reusing the plastic items instead of throwing them.




▸ In this project, use the steps of the Engineering Design Process that you have learnt in the previous educational grades to create a design of a "Mini-garden" at your home using empty plastic bottles.

## Idea

Create a "Mini-garden" using empty plastic bottles.



## Materials

You may use the following materials to build up your design:


Empty plastic bottles


Scissors


Thread


Wax gun


Soil


Different seeds

## Plan

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## Build

Draw your "Mini-garden" design.

## Improve

Write down your ideas to improve your "Mini-garden" design.

# Project

## Slippery Sands

In this project, you will make a research about how water can be used to make sand more slippery.

▶ **Read the following paragraph :**

- Scientists and historians have been wondering how the ancient Egyptians were able to move very large blocks of stones across the desert sands. Many scientists and historians have tried to find the answer of this question.
- **Historians :**
  - Historians have looked at one of the ancient Egyptians wall painting that shows how did they move a huge statue across the desert sands.
  - In the wall painting, historians have observed a person pouring a liquid from a jar in front of the sled. Historians believed that this was related to a holy ceremony.



- **Scientists :**
  - Scientists looked at the same painting in a different way.
  - Scientists had a theory that may be ancient Egyptians may have added water to the sand to make it more slippery, so they could move the huge statue more easily because the friction between the sled and the wet sand decreased.



  - Scientists said that sand particles are rough, but when water is added to sand, this makes the sand particles come closer and stick together, which decreases the friction between the sand particles and any object moving on them.

▸ Use the previous paragraph or online resources to write your claim, evidence and scientific explanation for the following question.



## The Question

Does adding water to the sand make the sand more slippery ?



## My Claim

.................................................................................................

.................................................................................................

.................................................................................................



## My Evidence

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## My Scientific Explanation

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EL-MOASSER

SERIES

# SCIENCE

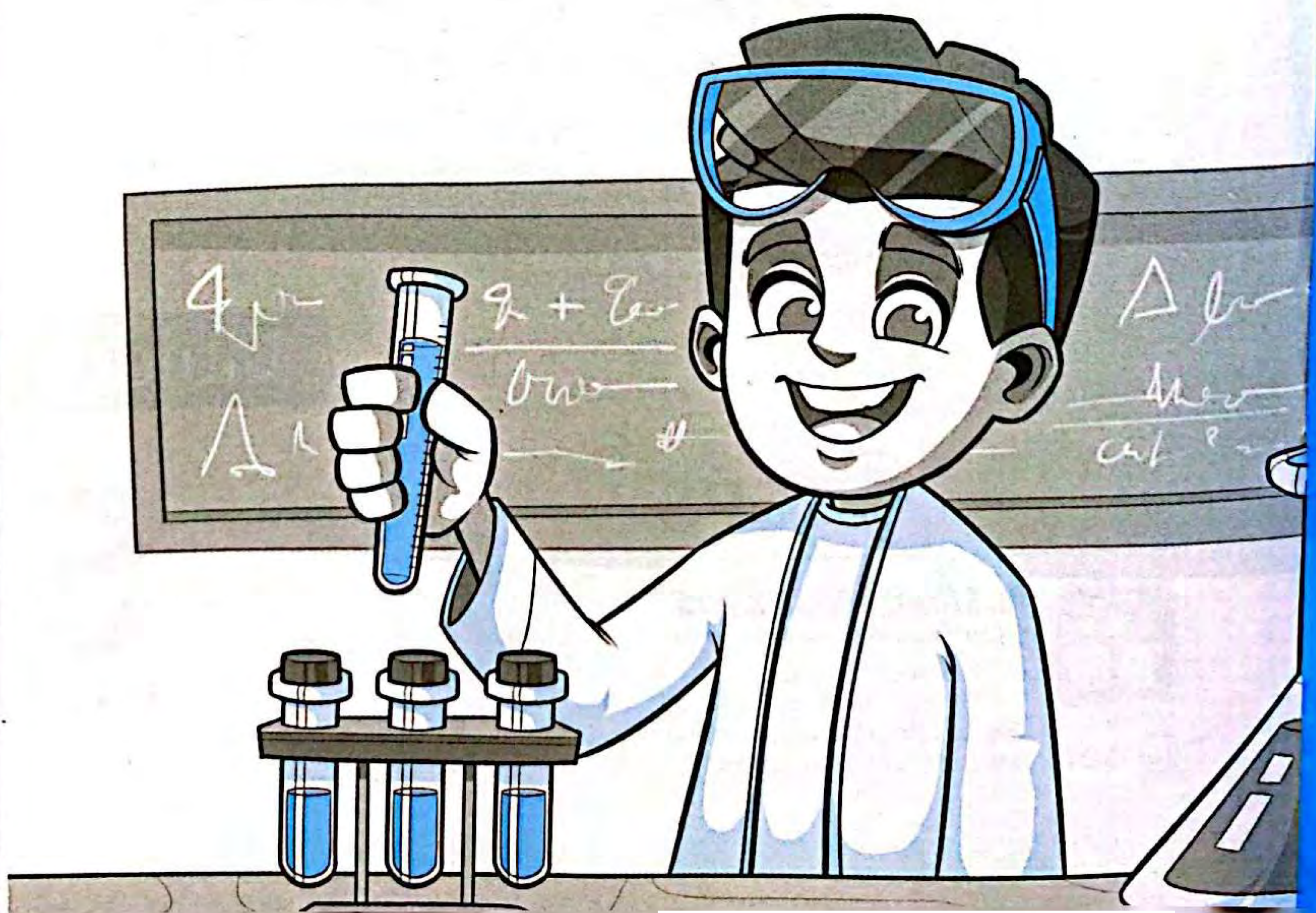
## Guide Answers

By A Group of Supervisors



# Contents





Part

1

# Guide Answers of Exercises on Lessons



## Concept (1.1)

### Exercises on Lesson 1

**1**
1. a 2. b 3. c 4. b
5. b 6. c 7. d 8. c
9. a 10. b

**2**
1. (✗) 2. (✗) 3. (✓) 4. (✓)
5. (✓) 6. (✗) 7. (✗)

**3**
1. leaves – roots.
2. water – nutrients – roots.
3. photosynthesis – leaves.
4. roots – leaves
5. the Sun
6. sugar – leaves
7. water

**4**
1. Carbon dioxide gas.
2. Water. 3. The stem.
4. Photosynthesis process.
5. Oxygen gas. 6. The Sun.

**5**
1. Oxygen gas (all items are plant's needs to grow, while oxygen gas is released during photosynthesis process).
2. Sunlight (all items are parts of the plant, while sunlight is an important source of energy for plant growth).

**6**
1. Because the roots help the plant to absorb water and nutrients from the soil.
2. Because it helps the plant to make its own food.

**7**
1. Water and nutrients will not be carried from the roots to the leaves.
2. Plants can't make their own food during photosynthesis process.
3. Plant's leaves will be yellow and can't make photosynthesis process.

**8**
1. b 2. e 3. a 4. d

**9**
ⓑ.

### Exercises on Lesson 2

**1**
1. b 2. b 3. a 4. c
5. d 6. c 7. d

**2**
1. (✗) 2. (✗) 3. (✗) 4. (✗)
5. (✓) 6. (✗) 7. (✗)

**3**
1. Photosynthesis
2. Carbon dioxide 3. dark green
4. roots

**4**
1. Photosynthesis process.
2. Plant's leaves.
3. Oxygen gas.
4. Sugar.

**5**
1. carbon dioxide gas – oxygen gas
2. water – roots.
3. the energy
4. water – sunlight

**6** Because they can make photosynthesis process.

**7**
1. It will germinate and grow well.
2. It will germinate and make sprouts for a while, then it will die.
3. The plant can't make photosynthesis process and it will die.

**8** 1. germination. 2. soil

**9**
1. figure Ⓐ – figure Ⓑ.
2. soil

## Exercises on Lesson 3

**1**

| | | | |
|---|---|---|---|
| 1. c | 2. b | 3. b | 4. c |
| 5. b | 6. c | 7. c | 8. a |
| 9. b | 10. c | 11. c | 12. d |
| 13. c | 14. b | 15. a | 16. b |

**2**

① 1. e 2. c 3. a 4. d

② 1. d 2. e 3. b 4. c 5. a

**3**

| | | | |
|---|---|---|---|
| 1. (✓) | 2. (✗) | 3. (✗) | 4. (✓) |
| 5. (✗) | 6. (✓) | 7. (✓) | 8. (✗) |
| 9. (✓) | 10. (✗) | 11. (✓) | 12. (✗) |
| 13. (✗) | 14. (✓) | 15. (✗) | 16. (✓) |
| 17. (✓) | 18. (✗) | | |

**4**
1. root hairs 2. the stem
3. tuber 4. runner
5. upright 6. gases
7. leaves 8. oxygen
9. Phloem

**5**
1. Plant's root. 2. Root hairs.
3. Plant's stem. 4. Xylem.
5. Climb stem.
6. Runner stem. 7. Potato plant.
8. Stomata. 9. Chlorophyll.
10. Phloem.
11. Carbon dioxide gas.

**6**
1. fix – nutrients
2. root hairs – water
3. xylem
4. climb stem – tuber stem
5. wood – upright
6. runner stems. 7. stomata
8. narrow – needles.
9. sugars – proteins
10. photosynthesis – phloem.
11. chlorophyll – the sunlight.

**7**
1. To increase the amount of absorbed water and nutrients that the plant needs from the soil.
2. Because they transport water and nutrients to the plant's leaves.
3. To allow gases to move into and out of the plant.
4. Because chlorophyll absorbs the energy from sunlight that helps the plant to make photosynthesis process.
5. Because plants produce oxygen gas during photosynthesis process which is important for all living organisms to breathe.

**8** 1. The plant can't absorb water and nutrients from the soil and also can't be fixed in the soil.
2. Gases can't move into or out of the plant's leaves and the plant will die.
3. The plant can't absorb the energy from sunlight and can't make photosynthesis process.
4. It can't make its own food and it will die.

**9** (1) soil (2) water
(3) nutrients (4) xylem
(5) leaves (6) flowers
(7) food
(8) photosynthesis

**10** 1. red. 2. xylem

## Exercises on Lesson 4

**1** 1. c 2. c 3. b 4. a
5. b 6. c 7. b 8. b
9. c 10. c 11. d 12. d
13. b

**2** 1. (✗) 2. (✓) 3. (✗) 4. (✗)
5. (✗) 6. (✓) 7. (✗) 8. (✓)
9. (✓) 10. (✓)

**3** 1. heart 2. Heart
3. one-way 4. Arteries
5. chemical
6. photosynthesis
7. seeds

**4** 1. Xylem.
2. Circulatory system.
3. Heart.
4. Blood capillaries.
5. Plant transport system.
6. Arteries. 7. Veins.
8. Glucose sugar.
9. Phloem. 10. Flowers.
11. Plant reproduction.

**5** 1. glucose
2. leaves – the nose – the mouth.
3. the heart – blood vessels.
4. glucose – oxygen
5. circulatory
6. two atria – two ventricles.
7. leaves
8. xylem – phloem.
9. heart – xylem – roots
10. light – chemical
11. seeds – reproduce.
12. arteries – veins – blood capillaries.

**6** 1. Because xylem carries water and nutrients from the roots to the leaves.
2. Because flowers produce seeds for the plant that help it to reproduce.

**7** 1. Plants can't get their needed energy to survive and grow.
2. The plant can't produce seeds that help it to reproduce.

**8** (1) plant parts. (2) blood.
(3) xylem. (4) arteries.
(5) phloem. (6) veins.

**9** (3) Vessels move glucose .....
(1) Light from the Sun ......
(4) Plant parts use the glucose ....

(2) The leaves transform light energy .....

**10** 1. ① Artery. ② Vein.
2. ② – ①
3. c

## Exercises on Lesson 5

**1** 1. b 2. d 3. a 4. c
5. d

**2** 1. b 2. d 3. a 4. c

**3** 1. (✗) 2. (✓) 3. (✓) 4. (✗)
5. (✗) 6. (✓)

**4** 1. water. 2. spiny
3. apple

**5** 1. coconut – maple (dandelion)
2. spines. 3. light seeds.

**6** 1. Because seeds can stick on animals fur or being eaten by animals and come out with their stool.
2. Because they are light seeds.
3. Because their seeds are spiny seeds.

## Model Exam (1) on Concept (1.1)

**1** (A) 1. b 2. c 3. b 4. d
(B) It will germinate and grow well.

**2** (A) 1. (✗) 2. (✓) 3. (✗) 4. (✓)
(B) Because they are spiny seeds.

**3** (A) 1. Water. 2. Flowers.
3. The Sun. 4. Potato plant.
(B) 1. figure Ⓐ – figure Ⓑ.
2. soil

## Model Exam (2) on Concept (1.1)

**1** (A) 1. water 2. chemical
3. heart 4. wood
(B) Because plants produce oxygen gas during photosynthesis process which is important for all living organisms to breathe.

**2** (A) 1. c 2. d 3. b 4. a
(B) 1. leaves 2. Xylem

**3** (A) 1. b 2. d 3. b 4. b
(B) 1. circulatory
2. ① Heart. ② Vein.
③ Artery.
④ Blood capillaries.

# Concept (1.2)

## Exercises on Lesson 1

**1** 1. c 2. d 3. b 4. c
5. d 6. b 7. c

**2** 1. (✗) 2. (✓) 3. (✓) 4. (✗)
5. (✓) 6. (✓)

**3** 1. Ecosystem.
2. Ecosystem.

**4** 1. plants (grasses)
2. soil.
3. ecosystem.
4. an ocean – a desert.

**5** To get energy as they cannot produce their own food.

**6** The hawk moves away to search for food in another ecosystem.

**7** 1. (A) and (B) – (C)
2. (B) 3. (B) and (C)

## Exercises on Lesson 2

**1** 1. b 2. d 3. b 4. c
5. a 6. b 7. b 8. d
9. b 10. c 11. d 12. b
13. c 14. c 15. c 16. b
17. d 18. b 19. c 20. b
21. d

**2** 1. c 2. d 3. a

**3** 1. (✗) 2. (✗) 3. (✓) 4. (✓)
5. (✗) 6. (✗) 7. (✓) 8. (✗)
9. (✓) 10. (✓) 11. (✗) 12. (✓)
13. (✗) 14. (✓)

**4** 1. Photosynthesis process.
2. The Sun. 3. Plants.
4. Glucose.
5. Carbon dioxide gas.
6. Oxygen gas.
7. Plants (producers).
8. Decomposers.
9. Decomposition process.
10. Food chain.
11. Prey. 12. Predator.

**5** 1. energy
2. water – carbon dioxide gas
3. food.
4. glucose sugar – oxygen gas
5. producers
6. consumers 7. plants.
8. decomposers. 9. primary
10. recycling

**6** 1. To get his needed energy to do his activities.
2. Because it is absorbed by the plants leaves to make their own food and grow, then humans and animals eat these plants.
3. Because consumers cannot make their own food.
4. Because decomposers return nutrients of dead organisms back to the soil.

**7** 1. The plants cannot make their own food by photosynthesis process, so there will be no life on Earth.
2. The secondary consumers will move away to another place to search for food or they will die.
3. Dead organisms will not be decomposed and their nutrients will not return back to the soil.

**8** (1) Grasses (2) Duck
(3) Fox
a. tertiary b. decomposers
c. light – photosynthesis

**9** 1. a plant 2. bacteria
3. primary 4. eagle
5. soil

## Exercises on Lesson 3

**1** 1. d 2. b 3. c 4. b
5. c 6. b 7. c 8. d
9. c

**2** 1. (✗) 2. (✓) 3. (✗) 4. (✓)
5. (✓) 6. (✓) 7. (✗)

**3** 1. food web. 2. producers.
3. secondary consumer.
4. primary consumers.

**4** 1. d 2. c

## Exercises on Lesson 4

**1** 1. b 2. d 3. d 4. a

**2** 1. (✓) 2. (✓) 3. (✗) 4. (✗)

**3** To disperse their seeds to other places.

## Model Exam (1) on Concept (1.2)

**1** (A) 1. b 2. a 3. d 4. c
(B) Dead organisms will not be decomposed and their nutrients will not return back to the soil.

**2** (A) 1. (✗) 2. (✗) 3. (✗) 4. (✓)
(B) Because they cannot get energy directly from the Sun.

**3** (A) 1. energy
2. glucose sugar – oxygen gas
3. primary 4. ecosystem.
(B) d

## Model Exam (2) on Concept (1.2)

**1** (A) 1. b 2. b 3. a 4. d
(B) Because consumers cannot make their own food.

**2** (A) 1. The Sun
2. Producers (plants).
3. Prey. 4. Food chain.
(B) 1. producers. 2. secondary

**3** (A) 1. e 2. c 3. d 4. a
(B) The plants cannot make their own food by photosynthesis process, so there will be no life on Earth

# Concept (1.3)

## Exercises on Lesson 1

**1** 1. c 2. b 3. a 4. c
5. d 6. b 7. a 8. b
9. c 10. b 11. d

**2** 1. (✓) 2. (✓) 3. (✗) 4. (✗)
5. (✓) 6. (✓) 7. (✗) 8. (✗)
9. (✗)

**3** 1. Water pollution.
2. Overfishing.
3. Top predators.

**4** 1. pollution.
2. increase . 3. overfishing
4. flooding 5. top predators.

**5** 1. Because they will not find enough food to eat.

2. Because sharks feed on different fish that depend on algae to get their food.

**6**
1. They will pollute water and marine organisms will be negatively affected.
2. The water in the lake decreases due to evaporation and may completely disappear.
3. The number of primary consumers increases and the amount of producers decreases.

**7**
1. grasses – foxes 2. decreases
3. rabbits 4. grasses

**8**
1. algae 2. butterflyfish
3. hawk

## Exercises on Lesson 2

**1**
1. c 2. d 3. b 4. c
5. d 6. d 7. c 8. b
9. a 10. c

**2**
1. (✓) 2. (✗) 3. (✗) 4. (✓)
5. (✓) 6. (✓) 7. (✓) 8. (✓)
9. (✓)

**3**
1. Tertiary consumers.
2. Decomposers.
3. Energy. 4. Population
5. Population change.
6. Seabirds.
7. Microorganisms.

**4**
1. preys 2. primary
3. decomposers 4. energy
5. increase.
6. microorganisms

**5** Because in the ecosystem, all species depend on other species to survive, so an increase or decrease in one species affects the population of other species.

**6**
1. The population of this species will decrease.
2. The microorganisms will move away to a cooler water and also fish that feed on microorganisms.

**7**
1. (✗) 2. (✗) 3. (✓) 4. (✓)
5. (✓)

**8**
1. (✗) 2. (✓) 3. (✓) 4. (✗)
5. (✗)

## Exercises on Lesson 3

**1**
1. c 2. d 3. b 4. a
5. c 6. b 7. d 8. c
9. b 10. b 11. c

**2**
1. (✓) 2. (✗) 3. (✓) 4. (✗)
5. (✓) 6. (✗) 7. (✓) 8. (✗)
9. (✓)

**3**
1. Coral bleaching.
2. Microplastics.
3. Coral reefs.

**4**
1. shelter. 2. overfishing.
3. extinction. 4. predator.
5. toxic.

**5** 1. Because when the water temperature rises, the coral reefs get rid of algae from their tissues and turn completely into white causing coral bleaching.
2. Because plastics are toxic and sharp.

**6** 1. (✗) 2. (✗) 3. (✓)

## Exercises on Lesson 4

**1** 1. d 2. b 3. c 4. a
5. d 6. b 7. d

**2** 1. (✓) 2. (✗) 3. (✓) 4. (✓)
5. (✓)

**3** 1. Nursery.
2. Habitat restoration.

**4** bleaching – nursery – grow up – dying.

**5** Due to eroding of riverbanks.

**6** b

**7** c

## Model Exam (1) on Concept (1.3)

**1** (A) 1. b 2. d 3. c 4. d
(B) The number of primary consumers increases, and the amount of producers decreases.

**2** (A) 1. (✓) 2. (✗) 3. (✓) 4. (✗)
(B) Because when the water temperature rises, the coral reefs get rid of algae from their tissues and turn completely into white causing coral bleaching.

**3** (A) 1. Nursery.
2. Microplastics.
3. Population.
4. Water pollution.
(B) 1. white.
2. primary

## Model Exam (2) on Concept (1.3)

**1** (A) 1. (✗) 2. (✗) 3. (✓) 4. (✓)
(B) Because in the ecosystem, all species depend on other species to survive, so an increase or decrease in one species affects the population of other species.

**2** (A) 1. d 2. b 3. c 4. b
(B) They will get rid of algae that live in their tissues, then turn completely into white causing coral bleaching.

**3** (A) 1. microorganisms.
2. primary consumers
3. small fish 4. preys
(B) 1. Rabbit (all items are top predators, while rabbit is a primary consumer)
2. Insects (all items are producers, while insects are consumers).

# Concept (2.1)

## Exercises on Lesson 1

**1** 1. b 2. a 3. d 4.a
5. c 6. d

**2** 1. c 2. d 3. b

**3** 1. (✓) 2. (✗) 3. (✓)
4. (✓) 5. (✓)

**4** 1. Matter. 2. Gas state.

**5** 1. solid – gas 2. solid
3. solid – gas 4. volume.

**6** 1. Wood (all items are liquids, while wood is solid).
2. Vinegar (all items are solids, while vinegar is liquid).
3. Coal (all items are gases, while coal is solid).

**7** Because it has mass and volume.

**8** It changes from liquid state into gas state.

**9** 1. (✓) 2. (✗)

## Exercises on Lesson 2

**1** 1. a 2. c 3. b 4. b
5. b 6. a 7. d 8. d
9. b 10. c 11. d

**2** 1. b 2. c 3. a

**3** 1. (✓) 2. (✗) 3. (✗) 4. (✗)
5. (✗) 6. (✗) 7. (✓) 8. (✗)
9. (✓) 10. (✓) 11. (✓)

**4** 1. Solid. 2. Liquid.
3. Gases. 4. Gases.
5. Measuring tape.
6. Thermometer.

**5** 1. solid – liquid 2. solid
3. liquid – gas 4. liquid.
5. length 6. solid
7. particles 8. solid
9. gas

**6** 1. Because it has definite shape and volume.
2. Because it is a solid matter.
3. Because it is a gas matter.
4. Because it is a solid matter.
5. Because it has no definite shape and takes the shape of its container.

**7** 1. It will take the shape of each container.
2. It will not change.
3. It will have a definite shape.

**8** 1. (✓) 2. (✓) 3. (✗) 4. (✗)

## Exercises on Lesson 3

**1** 1. d 2. b 3. a 4. b
5. a 6. a 7. c 8. d

**2** 1. (✗) 2. (✓) 3. (✗) 4. (✗)
5. (✓) 6. (✓) 7. (✓) 8. (✓)
9. (✗) 10. (✓)

**3** 1. Gas state.
2. Electron microscope.
3. Normal microscope

**4** 1. increase. 2. high
3. particles 4. solid
5. normal 6. solid – gas
7. liquid – shape

**5** 1. To study them in an easier way.
2. To see each tiny particle as it is more powerful than normal microscope.
3. Because they are not held together.
4. Because particles of liquids can slide over each other.

**6** 1. It will increase.
2. It will increase.
3. It will increase.

**7** 1. solid 2. increase

**8** 1. (B) 2. (C) – (A) – (B)
3. (C).

## Exercises on Lesson 4

**1** 1. b 2. a 3. c 4. a
5. b

**2** 1. (✗) 2. (✗) 3. (✓) 4. (✓)
5. (✓) 6. (✓)

**3** 1. Globe. 2. Model.

**4** 1. shape – volume.
2. solar 3. globe
4. microscope
5. volume – shape.

**5** To see the shape and parts of germs without microscope.

**6** It will be organized.

**7** 1. (1) 2. (2) 3. (3) 4. (3)

## Exercises on Lesson 5

**1** 1. b 2. d 3. b 4. a

**2** 1. (✓) 2. (✓) 3. (✗)

**3** 1. liquid. 2. space
3. solid – gas. 4. particles.
5. containers.

**4** Because it has no definite shape and definite volume.

**5** It charges from liquid state to solid state.

**6** 1. (✗) 2. (✓) 3. (✗) 4. (✗)

## Model Exam (1) on Concept (2.1)

**1** (A) 1. solid 2. liquid.
3. particles 4. normal
(B) Because it has no definite shape and takes the shape of their containers.

**2** (A) 1. (✓) 2. (✓) 3. (✗) 4. (✗)
(B) 1. Wood (all items are liquids, while wood is solid).
2. Vinegar (all items are solids, while vinegar is liquid).

**3** (A) 1. Measuring tape.
2. Particle.
3. Microscope. 4. Gas.
(B) 1. c 2. a

## Model Exam (2) on Concept (2.1)

**1** (A) 1. a 2. a
3. b 4. a
(B) it will increase.

**2** (A) 1. solid
2. liquid – shape
3. microscope
4. solid
(B) To see the shape and parts of germs without microscope.

**3** (A) 1. Electron microscope.
2. Model. 3. Solid.
4. Gas.
(B) 1. b 2. c

# Concept (2.2)

### Exercises on Lesson 1

**1** 1. a 2. a 3. d 4. d
5. b 6. b 7. b 8. d

**2** 1. c 2. a 3. d 4. b

**3** 1. (✓) 2. (✓) 3. (✗) 4. (✗)
5. (✗) 6. (✓) 7. (✗)

**4** 1. Ceramic tiles.
2. Strong stones. 3. Volume.
4. Mass. 5. Length.

**5** 1. climate
2. solid – liquid
3. mass
4. balance – thermometer
5. length – mass.
6. ceramic tiles – rains.

**6** 1. To protect the desert home from dust and dirt.
2. To protect the tropical rainforest home from animals getting inside.

**7** The rain will be collected on the top of cold weather homes.

**8** 1. A 2. C 3. B 4. A

**9** d

### Exercises on Lesson 2

**1** 1. d 2. d 3. c 4. d
5. a

**2** 1. (✗) 2. (✗) 3. (✓) 4. (✓)
5. (✓) 6. (✗)

**3** 1. physical 2. color
3. odor 4. smaller

**4** Because both of salt and pepper have different colors.

**5**
1. Sugar and Pepper.
2. Sugar and salt.
3. Salt and Pepper.

## Exercises on Lesson 3

**1**

| | | | |
|---|---|---|---|
| 1. d | 2. b | 3. c | 4. b |
| 5. a | 6. b | 7. d | 8. a |
| 9. c | 10. b | 11. d | 12. c |
| 13. a | 14. b | 15. a | |

**2**

| | | | |
|---|---|---|---|
| 1. (✗) | 2. (✗) | 3. (✗) | 4. (✓) |
| 5. (✓) | 6. (✓) | 7. (✓) | 8. (✗) |
| 9. (✓) | 10. (✓) | 11. (✓) | 12. (✓) |

**3**
1. Physical properties.
2. Chemical properties.
3. Volume. 4. Mass.
5. Temperature.

**4**
1. Physical 2. chemical
3. temperature 4. rough
5. doesn't attract – floats
6. sinks – attracted
7. volume
8. one thousand 9. mass
10. iron – cotton.

**5**
1. Because rusting of iron is a change that happens to iron when it interacts with air and water.
2. Because quickly moving particles produce more heat energy which cause increasing in temperature.

**6**
1. The paper becomes ash.
2. The temperature of the matter will decrease.
3. The iron nail will attract to the magnet, while the plastic spoon will not attract to the magnet.
4. The piece of cork will float on the surface of water.

**7**

| | | | |
|---|---|---|---|
| 1. P | 2. C | 3. P | 4. P |
| 5. C | 6. P | 7. P | |

**8**

| | | | |
|---|---|---|---|
| 1. B | 2. A | 3. A | 4. B |

## Exercises on Lesson 4

**1**

| | | | |
|---|---|---|---|
| 1. a | 2. d | 3. b | 4. c |
| 5. a | 6. b | 7. c | 8. d |
| 9. d | | | |

**2**
1. e → B 2. d → D
3. b → E 4. a → C
5. c → A

**3**

| | | | |
|---|---|---|---|
| 1. (✓) | 2. (✗) | 3. (✗) | 4. (✓) |
| 5. (✓) | 6. (✗) | 7. (✓) | 8. (✗) |

**4**
1. Conduction. 2. Helium gas.
3. Rubber.

**5**
1. chemical 2. helium – air.
3. flammable – poisonous
4. physical
5. heat – electricity.
6. copper – hard – strong.
7. rubber
8. smooth – transparent.
9. copper – wood

**6** 1. Because helium is lighter than air.
2. Because helium is not flammable or poisonous.
3. Because wood and plastic are bad conductors of heat.

**7** 1. The blimp will rise up in the air.
2. It will not conduct electricity.

**8** 1. Copper. 2. Helium
3. Rubber 4. Steel.
5. Glass.

## Model Exam (1) on Concept (2.2)

**1** (A) 1. b 2. a 3. c 4. a
(B) Because helium is not flammable or poisonous.

**2** (A) 1. (✗) 2. (✓) 3. (✗) 4. (✓)
(B) The iron nail will attract to the magnet, while the plastic spoon will not attract to the magnet.

**3** (A) 1. c 2. a 3. d 4. b
(B) 1. Rubber.
2. Steel.

## Model Exam (2) on Concept (2.2)

**1** (A) 1. (✗) 2. (✗) 3. (✓) 4. (✓)
(B) To protect the tropical rainforest home from animals getting inside.

**2** (A) 1. chemical
2. temperature
3. climate 4. mass
(B) The temperature of the matter will decrease.

**3** (A) 1. Physical properties.
2. Mass. 3. Helium.
4. Conduction.
(B) 1. B 2. A 3. A 4. B

# Concept (2.3)

## Exercises on Lesson 1

**1** 1. b 2. d 3. d 4. b
5. b 6. c 7. c 8. a
9. d 10. c

**2** 1. (✗) 2. (✓) 3. (✗) 4. (✓)
5. (✗) 6. (✗) 7. (✓)

**3** 1. increasing 2. solid – liquid
3. thermal energy.
4. close together. 5. increase.
6. melting 7. melts
8. melt. 9. increase

**4** 1. Because the temperature of ice increases, so it will melt and becomes liquid.
2. Because the particles of water move faster, vibrate and spin around faster.

**5** 1. Ice cubes will melt and become liquid water.
2. The particles of water will move faster.

**6** 1. 1 2. 3
3. 2 4. 1 – 3

## Exercises on Lesson 2

**1**
1. b 2. a 3. c 4. c
5. d 6. d 7. c 8. b
9. b 10. d 11. c 12. b
13. a 14. c

**2**
1. c 2. a 3. e 4. d

**3**
1. (✗) 2. (✓) 3. (✓) 4. (✓)
5. (✓) 6. (✗) 7. (✓) 8. (✓)
9. (✗) 10. (✗) 11. (✗)

**4**
1. Physical changes.
2. Melting process.
3. Freezing process.
4. Liquid state.

**5**
1. temperature 2. melting
3. freezing 4. temperature
5. water. 6. thermal
7. increase 8. decrease
9. gas
10. melting – evaporation
11. solid.

**6**
1. Because ice cubes will gain thermal energy, so it changes to liquid water.
2. Because in these processes the matter changes without any change in its structure.
3. Because water vapor loses thermal energy to the cold surface, so the particles of water vapor move slower and get close together forming water drops.

**7**
1. The particles of water release thermal energy and they move slower and get close together forming solid ice.
2. The particles of water gain more thermal energy and they move faster and spread more forming water vapor.

**8**
1. B – A – C 2. A – B – D

## Exercises on Lesson 3

**1**
1. b 2. b 3. b 4. a
5. d 6. a 7. d 8. a
9. c 10. d

**2**
1. (✗) 2. (✗) 3. (✓) 4. (✗)
5. (✗) 6. (✗) 7. (✗) 8. (✗)
9. (✓) 10. (✗) 11. (✓) 12. (✗)

**3**
1. Compound. 2. Mixture.

**4**
1. compound 2. compound
3. color
4. mass – properties
5. changed. 6. solid – liquid
7. filtration 8. evaporation
9. the same

**5**
1. Because they are formed of two or more materials.
2. Because the particles of water are smaller than that of soil.
3. Because mixing baking soda with vinegar produces gas causing bubbles which means that the properties of the substances are changed.

6 1. The water will evaporate leaving the salt in the container.
2. The mass and properties sugar will not change.

7 1. (✗) 2. (✓) 3. (✗)

8 1. Solid 2. Gas
3. Liquid
4. Solid and liquid

9 1. 5 gm 2. 10 gm
3. changed into new color.
4. C

## Exercises on Lesson 4

1 1. d 2. a 3. a 4. b
5. b 6. d 7. c 8. b
9. d 10. b 11. c 12. d

2 1. b 2. d 3. a 4. c

3 1. (✗) 2. (✓) 3. (✓) 4. (✗)
5. (✗) 6. (✓) 7. (✗) 8. (✗)
9. (✓) 10. (✓)

4 1. physical – chemical.
2. oxygen – chemical
3. chemical
4. physical – chemical
5. physical
6. substance – properties
7. chemical – physical
8. chemical – physical
9. chemical

5 1. Because the taste of the bread is not like its ingredients which means that a new substance is formed.
2. Because when iron reacts with oxygen and water, it rusts (form a chemical substance called iron oxide).
3. Due to the chemical change that happens to the milk.
4. Because maxing fruit salad don't form new substance.

6 1. A new substance is formed and its color is dark blue.
2. They release heat that can start a fire.
3. The piece of metal will lose it's shining.

7 Because mixing vinegar with baking soda produces gas bubbles which cause inflating of the balloon.

8 1. Chemical change.
2. oxygen – water – rusting.

9 1. The ice cube will melt and changing into water.
2. Physical change, because it is the change of the state of water without any change in its structure.

## Exercises on Lesson 5

**1** 1. d 2. b 3. d 4. a
5. b 6. b

**2** 1. (✓) 2. (✗) 3. (✗) 4. (✗)
5. (✗) 6. (✓) 7. (✗)

**3** 1. Desalination process.
2. Filtration process.
3. Evaporation process.

**4** 1. energy – expensive
2. salt – marine
3. fresh – oceans – seas.
4. filtration

**5** Because it is a mixture of water, salt, other minerals, gases, living organisms and dead organisms.

**6** Water vapor rises up leaving salts and other minerals.

**7** 1. 1 2. 4 3. 2 4. 3

## Model Exam (1) on Concept (2.3)

**1** (A) 1. temperature.
2. compounds
3. new
4. chemical

(B) Because in these processes the matter changes without any change in its structure.

**2** (A) 1. a 2. d 3. b 4. a

(B) The mass and properties of sugar don't change.

**3** (A) 1. (✓) 2. (✗) 3. (✗) 4. (✓)

(B) 1. Compound.
2. Desalination process.

## Model Exam (2) on Concept (2.3)

**1** (A) 1. b 2. d 3. a 4. c

(B) Because when iron reacts with oxygen and water it rusts (form a chemical reddish color substance called iron oxide).

**2** (A) 1. (✗) 2. (✓) 3. (✓) 4. (✗)

(B) The water will evaporate leaving the salt in the container.

**3** (A) 1. Melting process.
2. Mixture.
3. Filtration process.
4. physical changes.

(B) 1. The ice cube will melt and changes into water.
2. Physical change, because it is the change of the state of water without any change in its structure.

Part

2

# Guide Answers of Self-Assessments



PART 2

# UNIT ONE : Interactions of Organisms

## Concept (1.1)

### Self-Assessment 1

**1** (A) 1. a 2. c 3. d

(B) Because plants make their own food in their leaves during photosynthesis process.

---

**2** (A) 1. (✓) 2. (✗) 3. (✓)

(B) The plant can't make photosynthesis process, so it will die.

---

**3** 1. leaves. 2. stem – roots

3. carbon dioxide

### Self-Assessment 2

**1** (A) 1. (✗) 2. (✗) 3. (✓)

(B) Because it carries water and nutrients from the roots to the leaves.

---

**2** (A) 1. Roots

2. Carbon dioxide gas

3. Germination

(B) The seeds will germinate and make sprouts and begin to grow.

---

**3** 1. b 2. d 3. a

### Self-Assessment 3

**1** (A) 1. Chlorophyll 2. root hairs

3. photosynthesis

(B) The color of leaves will be turned into the same color of water in the cup.

---

**2** (A) 1. roots 2. soil.

3. stem

(B) To transport the food materials from the leaves to the other parts of the plant.

---

**3** 1. green – yellow. 2. stomata.

3. oxygen gas 4. xylem.

### Self-Assessment 4

**1** (A) 1. a 2. b 3. c

(B) Because during photosynthesis process, plants produce oxygen gas which is important for all living organisms to breathe.

---

**2** (A) 1. (✓) 2. (✓) 3. (✗)

(B) The plants can't absorb more water and nutrients from the soil.

---

**3** 1. veins – nutrients

2. sugar – phloem.

3. xylem. 4. arteries

### Self-Assessment 5

**1** (A) 1. (✗) 2. (✓) 3. (✓)

(B) Because they increase the amount of absorbed water and nutrients from the soil.

2 (A) 1. Human circulatory system.
2. Seed dispersal.
3. Plant reproduction.
(B) Plant's leaves will be pale green or yellow.

3 1. wind – light seeds.
2. water.

## Model Exam on Concept (1.1)

1 (A) 1. water – nutrients – roots.
2. veins – blood capillaries.
3. wood
4. xylem – phloem.
(B) Because it transports water and nutrients from the roots to the leaves.

2 (A) 1. b 2. d 3. a 4. c
(B) The plant can't produce seeds that help it to reproduce.

3 (A) 1. (✓) 2. (✗) 3. (✗) 4. (✓)
(B) 1. Chlorophyll.
2. Glucose sugar.

# Concept (1.2)

## Self-Assessment 6

1 (A) 1. (✗) 2. (✓) 3. (✗)
(B) Because different animals eat plants or other animals or both of them to get energy.

2 (A) 1. the Sun.
2. ecosystem.
3. energy.
(B) It decomposes and its energy is returned to the soil.

3 1. b 2. d 3. a

## Self-Assessment 7

1 (A) 1. b 2. d 3. c
(B) Because producers use the light energy of the Sun to make their own food through photosynthesis process.

2 (A) 1. Nonliving things (All items are living organisms, except nonliving things).
2. Consumers (All items are related to photosynthesis except consumers).
3. Snakes (All items are decomposers, while snakes are consumers).
(B) 1. plant – it makes its own food.
2. bird – it eats grasshopper which is a primary consumer.

3 **Producers :** photosynthesis
**Consumers :** living organisms
**Decomposers :** decomposition

## Self-Assessment 8

1 (A) 1. b 2. d 3. c
(B) Becuase the living organism that eats plants is considered as a primary consumer.

**2** (A) 1. Rabbits (all items are predators, while rabbits are primary consumers).
2. Plants (all items are decomposers, while plants are producers).
3. Bacteria (all items are primary consumers, while bacteria are decomposers).

(B) - Grasses ⟶ Deer ⟶ Lion
- Grasses ⟶ Deer ⟶ Alligator

**3** 1. d  2. c  3. b  4. d

## Self-Assessment 9

**1** (A) 1. (✓)  2. (✓)  3. (✗)

(B) Because they can be carried away by air to other places.

**2** (A) 1. a  2. b  3. c

(B) All living organisms in this ecosystem will move away to another healthy ecosystem or they will die.

**3** Figure (B)

## Model Exam on Concept (1.1) & (1.2)

**1** (A) 1. d  2. c  3. c  4. b

(B) The secondary consumers will move away to another place to search for food, or they will die.

**2** (A) 1. (✗)  2. (✓)  3. (✗)  4. (✓)

(B) c

**3** (A) 1. Carbon dioxide gas.
2. Root hairs.
3. Decomposers.
4. Flowers.

(B) 1. d  2. c

# Concept (1.3)

## Self-Assessment 10

**1** (A) 1. Sea stars (all items are producers, while sea stars are primary consumers).
2. Algae (all items are primary consumers, while algae are producers).
3. Snakes (all items are top predators, while snakes are secondary consumers).

(B) Because all food chains begin with producers that depend on sunlight to make their own food.

**2** (A) 1. c  2. d  3. d

(B) 1. Producers  2. Clam
3. Secondary consumer
4. Top predator

**3** Grasses ⟶ Deer ⟶ Lion

## Self-Assessment 11

**1** (A) 1. Decomposers (all items are types of consumers except decomposers).
2. Clam (all items live on land, while clam lives in water).

3. Tiger (all items can form one food chain, while tiger doesn't share in this food chain).

(B) Because predators feed on other consumers, which previously fed on plants or animals.

2 (A) 1. primary consumer
2. producers 3. sunlight

(B) The number of microorganisms on which small fish feed on will increase.

3 1. (✗) 2. (✓) 3. (✗) 4. (✓)

**Self-Assessment 12**

1 (A) 1. coral bleaching
2. plastic 3. producers.

(B) They will get rid of algae that live in their tissues, then turn completely into white causing coral bleaching.

2 (A) 1. toxic and sharp 2. white.
3. real food

(B) Because plastic products are toxic and sharp that harm marine organisms.

3 Algae ⟶ Zooplankton ⟶ Corals ⟶ Parrotfish ⟶ Shark

**Self-Assessment 13**

1 (A) 1. (✓) 2. (✓) 3. (✗)

(B) The number of this animal species decreases gradually and may extinct.

2 (A) 1. d 2. c 3. a

(B) Because it decreases the amount of producers which consumers feed on, and also causes flooding due to riverbanks eroding.

3 1. Zero plastics
2. Habitat restoration
3. nursery.

**Model Exam on Theme (1)**

1 (A) 1. d 2. b 3. b 4. a

(B) Because green plants absorb sunlight during photosynthesis process to make their own food and produce oxygen gas that all other living organisms need for breathing.

2 (A) 1. Producers. 2. Chlorophyll.
3. Decomposers.
4. Population.

(B) Small fish don't find their food because microorganisms move to another place where the water is cooler.

3 (A) 1. consumers
2. wind. 3. preys
4. top predators.

(B) Microorganisms ⟶ Small fish ⟶ Seabirds

## Assess Your Learning on Theme (1)

**1** 1. c 2. b 3. b 4. a
5. d 6. b

**2** 1.

| The plant in the light | The plant in the dark |
|---|---|
| - Its leaves are dark green color.<br>- It can make its own food, because it can make photosynthesis process. | - Its leaves are yellow color or pale green color.<br>- It can't make its own food, because it can't make photosynthesis process. |

2. Look at the Assessment Book on page (52)

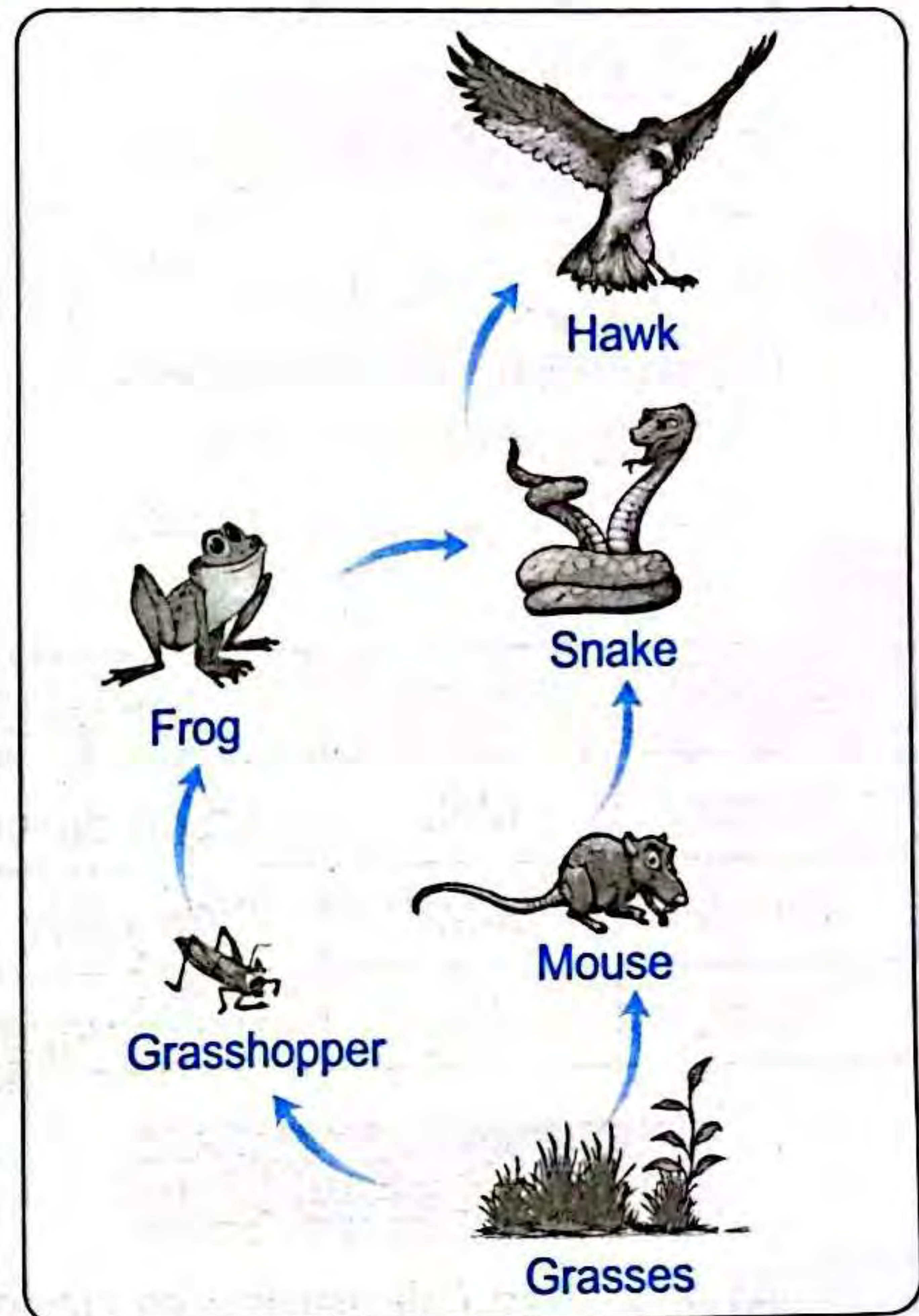
3.

| The producer organisms | The consumer organisms |
|---|---|
| They are organisms that can make their own food and don't feed on other plants or animals. | They are organisms that eat other living organisms to get their energy, because they cannot make their own food. |

**3** 1. (✓) 2. (✗) 3. (✗) 4. (✗)
5. (✓) 6. (✗)

**4** 1. Decomposer ............
2. ............ white.
3. ............ the sunlight ............

**5** 1.




2. - Grasses : producers.
- Mouse and grasshopper : primary consumers.
- Snake and frog : secondary consumers.
- Hawk : tertiary consumer.

# Concept (2.1)

## Self-Assessment 14

**1** (A) 1. solid 2. solid
3. gas
(B) It becomes a gas.

**2** (A) 1. (✗) 2. (✓) 3. (✗)
(B) Because it has mass and volume.

**3**

| Solids | Liquids | Gases |
|---|---|---|
| Sugar | Milk | Carbon dioxide |
| Stone | Blood | Oxygen |
| Coal | Oil | Water vapor |

## Self-Assessment 15

**1** (A) 1. Glass (all items are gases, while glass is solid).
2. Air (all items are solids, while air is gas).
3. Coin (all items are liquids, while coin is solid).
(B) Because it has no definite shape and it has definite volume.

**2** (A) 1. gas 2. mass
3. scale.
(B) It will have no definite shape.

**3** 1. (A) → (B) → (C)
2. (C) → (B) → (A)

## Self-Assessment 16

**1** (A) 1. particles.
2. microscope. 3. solids.
(B) Because it helps us see tiny different particles that made up different matter.

**2** (A) 1. liquid 2. gas
3. definite
(B) The particles of balloon come close together, so the balloon becomes smaller.

**3** 1 → d → B
2 → c → C
3 → a → D

## Self-Assessment 17

**1** (A) 1. (✓) 2. (✗) 3. (✗)
(B) Because it has mass and volume.

**2** (A) 1. solids 2. energy.
3. similar to
(B) It will take the shape of their containers.

**3**

| Regular pattern | Random arrangement |
|---|---|
| Wood<br>Plastic | Water<br>Oxygen<br>Oil<br>Carbon dioxide |

## Self-Assessment 18

**1** (A) 1. (✓) 2. (✗) 3. (✓)
(B) Because it is a gas.

**2** (A) 1. volume. 2. solids
3. solids
(B) It will increase.

**3** 1. solid 2. liquid
3. gas

## Model Exam on Concept (2.1)

**1** (A) 1. particles. 2. solar
3. solid 4. liquid
(B) Because it has definite shape and volume.

**2** (A) 1. c 2. b 3. c 4. a
(B) It will be organized.

**3** (A) 1. (✓) 2. (✗) 3. (✗) 4. (✗)
(B) 1. Coal (all items are gases, while coal is solid).
2. Wood (all items are liquids, while wood is solid).

# Concept (2.2)

## Self-Assessment 19

**1** (A) 1. slanted 2. climate.
3. thermometer.
(B) Because roofs of cold weather homes are made of ceramic tiles and they are slanted.

**2** (A) 1. (✗) 2. (✓) 3. (✓)
(B) 1. Balance.
2. Measuring cup.

**3** 1. 2 – rains. 2. 1 – dust – dirt.
3. 3 – animals getting inside.

## Self-Assessment 20

**1** (A) 1. d 2. a 3. d
(B) Becuase each of salt and sugar have the same white color.

**2** (A) 1. balance.
2. cold weather
3. shape
(B) Taste and smell.

**3** 1. B 2. A 3. C

## Self-Assessment 21

**1** (A) 1. c 2. a 3. d
(B) Because mass of matter is changed by changing its size.

**2** (A) 1. (✗) 2. (✓) 3. (✗)
(B) It doesn't attract to the magnet.

**3** 1. material (A).
2. material (B). 3. balance.

## Self-Assessment 22

**1** (A) 1. d 2. b 3. a
(B) Because glass is transparent and smooth.

2 (A) 1. Rusting (all items are physical properties of matter, while rusting is a chemical property of matter).
2. Kilogram (all items are measuring units of volume, while kilogram is a measuring unit of mass).
3. Iron nail (all items are not attracted to the magnet, while iron nail is attracted to the magnet).
(B) The piece of cork will float on the surface of water.

---

3 1. B – hard – strong.
2. C – waterproof – flexible.
3. A – transparent – smooth.

## Model Exam on Concepts (2.1) & (2.2)

1 (A) 1. increases. 2. mass
3. microscope 4. rubber
(B) Because rusting of iron is a change which happens in iron when it interacts with water and air.

---

2 (A) 1. (✓) 2. (✗) 3. (✗) 4. (✓)
(B) It will have definite shape.

---

3 (A) 1. c 2. b 3. b 4. c
(B) 1. B 2. A

# Concept (2.3)

## Self-Assessment 23

1 (A) 1. mass 2. melting
3. heated
(B) Because thermal energy is used in many things every day such as cooking food and warming homes.

---

2 (A) 1. water. 2. heating.
3. faster.
(B) They will melt and change into liquid water.

---

3 1. B 2. A 3. C
4. B

## Self-Assessment 24

1 (A) 1. heating.
2. thermal
3. condensation
(B) Because when decreasing the temperature of water, its particles lose energy and move slower, so water changes into ice.

---

2 (A) 1. condensation
2. away from
3. water vapor.
(B) The distance between particles of water vapor will decrease and changes into liquid water.

**3** 1. Ice. 2. Water.
3. Water vapor. 4. Melting
5. Freezing 6. Evaporation
7. Condensation

## Self-Assessment 25

**1** (A) 1. temperature
2. filtration
3. mass – properties

(B) Because each material in a mixture keeps its properties without any change.

**2** (A) 1. faster 2. solid
3. mixture

(B) The mass of apple pieces remains as it is without any change.

**3** 1. 20 2. 30 3. 30
4. remain as it is.

## Self-Assessment 26

**1** (A) 1. c 2. c 3. d

(B) Because coloring a paper is a change in matter without any change in its structure.

**2** (A) 1. gas 2. compound
3. chemical

(B) Iron wire will rust.

**3** 1. Evaporation process.
2. Condensation process.
3. Physical change.
4. Salt only.

## Self-Assessment 27

**1** (A) 1. c 2. b 3. d

(B) Because it consists of water, salt, other minerals, gases, living organisms and dead organisms.

**2** (A) 1. (✗) 2. (✓) 3. (✓)

(B) The particle of ice will move faster and changes into liquid water.

**3** 1. 1 – 4 2. 3 – 2
3. Physical change.

## Model Exam on Theme (2)

**1** (A) 1. d 2. b 3. c 4. a

(B) To examine one tiny particle such as a blood cell.

**2** (A) 1. rough 2. physical
3. solid 4. ceramic tiles

(B) It will melt and changes into liquid water.

**3** (A) 1. b 2. c 3. a

(B) 1. solid 2. increase

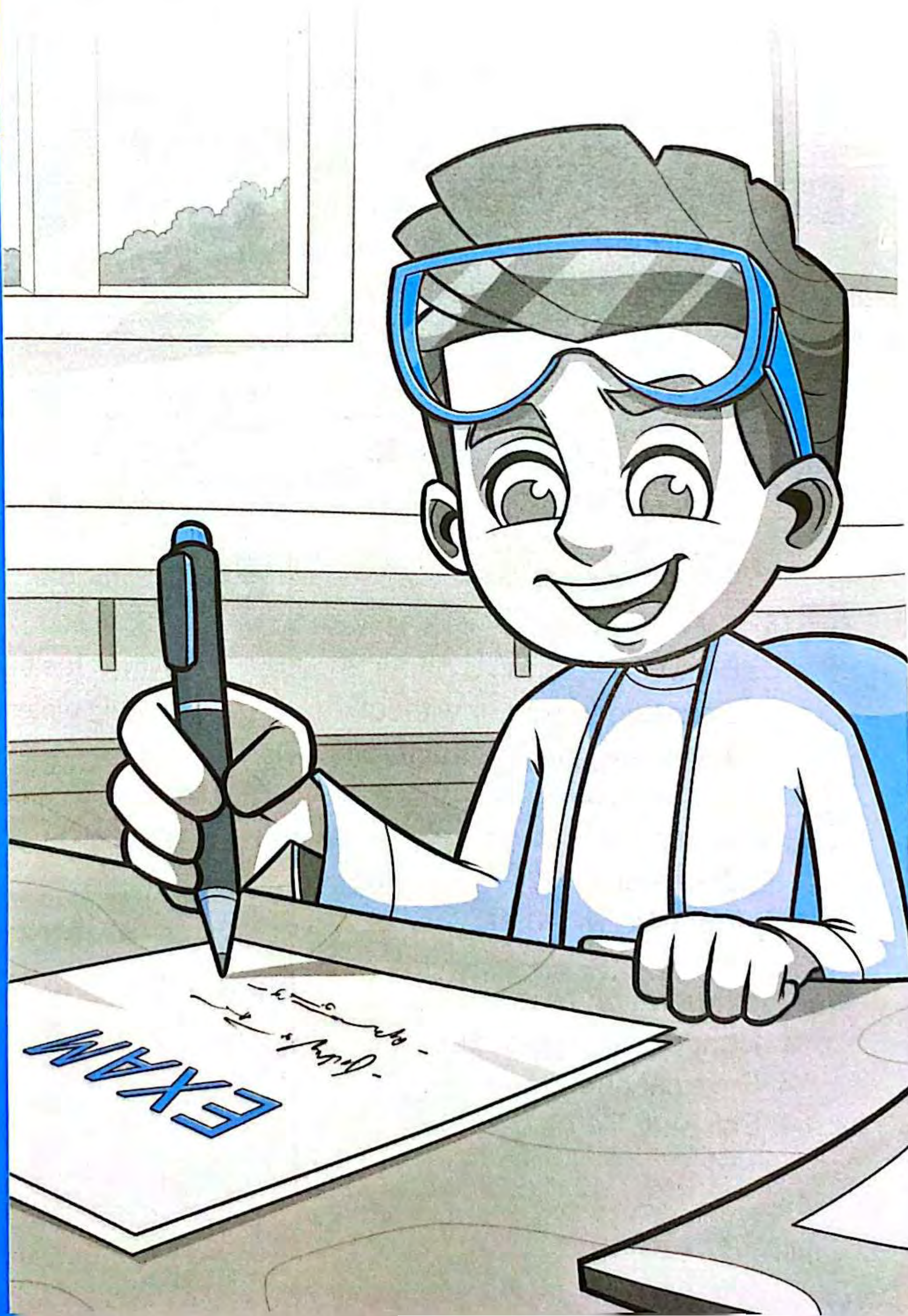
## Assess Your Learning on Theme (2)

1. d 2. c 3. d 4. b 5. d
6. a 7. d 8. c 9. a 10. b

Part

# 3

# Guide Answers of Final Examinations



# PART 3 Model Examinations

## El-Moasser Final Examination Models

### Model Exam 1

**1** (A) 1. c  2. c  3. b  4. c
(B) To protect the desert home from dust and dirt.

---

**2** (A) 1. (✓)  2. (✗)  3. (✓)  4. (✗)
(B) It can't make photosynthesis process and it will die.

---

**3** (A) 1. pollution.
2. consumers – decomposers
3. stomata
4. physical – chemical
(B) 1. Wood, (all items are liquids, while wood is solid).
2. Sunlight, (all items are parts of the plant, while sunlight is an energy).

### Model Exam 2

**1** (A) 1. melts
2. chemical
3. steel – hard
4. balance – thermometer
(B) The speed of particles will increase.

---

**2** (A) 1. Population.  2. Prey.
3. Water.
4. Plant's root.
(B) To get his needed energy to do his activities.

**3** (A) 1. c  2. a  3. e  4. d
(B) 1. white.  2. wood

### Model Exam 3

**1** (A) 1. (✗)  2. (✗)  3. (✓)  4. (✗)
(B) The magnet attracts iron nail but it doesn't attract the plastic spoon.

---

**2** (A) 1. shelter.  2. overfishing.
3. predator  4. toxic
(B) 1. leaves  2. roots

---

**3** (A) 1. Melting process.
2. Volume.
3. Globe.
4. Tertiary consumers.
(B) Because the temperature of ice increases so, it will melt and becomes liquid.

### Model Exam 4

**1** (A) 1. Plant' reproduction.
2. Producers.
3. Seabirds.  4. Solid state.
(B) Because helium is lighter than air.

---

**2** (A) 1. (✓)  2. (✗)  3. (✗)  4. (✓)
(B) Water and nutrients will not move up from the roots to the leaves.

3 (A) 1. b 2. c 3. b 4. a
(B) 1. (✗) 2. (✓) 3. (✗) 4. (✗)

## Model Exam 5

1 (A) 1. b 2. b 3. b 4. c
(B) 1. (✓) 2. (✓) 3. (✗) 4. (✗)

2 (A) 1. ecosystem.
2. hot – cold
3. flammable – poisonous
4. stomata
(B) Because by increasing temperature, it will gain thermal energy and changed into liquid water.

3 (A) 1. Physical changes.
2. Evaporation process.
3. Measuring tape.
4. Top predators.
(B) The plant can't absorb the energy of sunlight, so it can't make photosynthesis process.

## Model Exam 6

1 (A) 1. sugar – leaves
2. carbon dioxide gas – water
3. decomposers – primary consumers
4. liquid – shape
(B) To protect this home from animals getting inside.

2 (A) 1. c 2. a 3. c 4. c
(B) 1. c 2. d 3. a

3 (A) 1. (✓) 2. (✓) 3. (✗) 4. (✓)
(B) The microorganisms will move to a cooler water.

## Model Exam 7

1 (A) 1. Overfishing.
2. Oxygen gas.
3. plant transport system.
4. Temperature.
(B) The temperature of the matter will decrease.

2 (A) 1. (✓) 2. (✓) 3. (✗) 4. (✗)
(B) Because it absorbs the energy of sunlight that helps the plant to make photosynthesis process.

3 (A) 1. d 2. c 3. d 4. b
(B) 1. (B)
2. (C) – (A) – (B)
3. (C)

## Model Exam 8

1 (A) 1. (✓) 2. (✗) 3. (✓) 4. (✓)
(B) Because it is not flammable and not poisonous.

**2** (A) 1. c 2. b 3. b 4. a

(B) The speed of particles will increase.

**3** (A) 1. liquid 2. space

3. solid – gas. 4. particles.

(B) 1. c 2. a

## Model Exam 9

**1** (A) 1. a 2. d 3. b 4. c

(B) The water of the lake decreases due to evaporation and may completely disappear.

**2** (A) 1. physical 2. odor

3. rough 4. chemical

(B) Because in these processes the matter changes without any change in its structure.

**3** (A) 1. (✗) 2. (✓) 3. (✓) 4. (✓)

(B) 1. solid 2. increase

## Model Exam 10

**1** (A) 1. (✓) 2. (✗) 3. (✗) 4. (✗)

(B) 1. plants

2. Carbon dioxide

**2** (A) 1. Electron microscope.

2. Liquid state.

3. Photosynthesis process.

4. Flowers.

(B) Because it is a solid matter.

**3** (A) 1. d 2. c 3. a 4. b

(B) 1. (1) 2. (2)

# Final Examinations of Some Governorates

## Cairo Governorate

### 1 Heliopolis Edu. Administration

**1** (A) 1. b 2. a 3. d 4. a

(B) - They fix the plant in the soil.

- They absorb water and nutrients from the soil to the plant.

**2** (A) 1. helium – lighter

2. turtle – plastic
3. carbon dioxide – the heart.
4. melting – condensation.

(B) Population.

**3** (A) 1. (✗) 2. (✓)

3. (✗) 4. (✗)

(B) 1. Grass. 2. Consumers.

### 2 Al Khalifa and Al Mokattam Directorate

**1** (A) 1. Oxygen 2. Humans

3. decomposers.
4. water.

(B) Melting process.

**2** (A) 1. a 2. c 3. a 4. c

(B) Because they have definite shape and volume.

**3** (A) 1. (✓) 2. (✗)

3. (✓) 4. (✗)

(B) Oxygen (all items are solids, while oxygen is a gas).

### 3 New Cairo Administration Capital School

**1** (A) 1. solid – liquid

2. arteries – veins
3. oxygen gas – sugar
4. liquid – gas

(B) Because chlorophyll absorbs the energy of sunlight that helps the plant to make photosynthesis process.

**2** (A) 1. Tertiary consumers.

2. Matter.
3. Measuring tape.
4. The stem.

(B) Grass ⟶ Rabbit ⟶ Snake ⟶ Hawk

**3** (A) 1. c 2. d 3. a 4. c

(B) The plant can't make photosynthesis process and it will die.

### 4 Shubra Edu. Directorate

**1** (A) 1. melting

2. Measuring cup
3. phloem.
4. primary consumers.

(B)

| Basic plant need for photosynthesis | Not basic plant need for photosynthesis |
|---|---|
| - Sunlight. | - Soil. |

**2** (A) 1. c 2. a 3. a 4. c

(B) Because it helps the plant to make its own food.

**3** (A) 1. (✓) 2. (✗)
3. (✓) 4. (✗)

(B) Algae ⟶ Zooplankton ⟶ Coral ⟶ parrotfish ⟶ Shark

## Giza Governorate

### 5 El Dokki Edu. Directorate

**1** (A) 1. c 2. b 3. b 4. c

(B) Grass ⟶ Grasshopper ⟶ Frog ⟶ Snake ⟶ Hawk.

**2** (A) 1. chemical
2. Overfishing
3. physical 4. Shelter

(B) 1. Traveling by wind.
2. Floating on water.

**3** (A) 1. (✓) 2. (✓)
3. (✗) 4. (✓)

(B) 1. Oxygen gas (all items are plant's needs to grow, while oxygen gas is released during photosynthesis process).
2. Oxygen (all items are solids, while oxygen is a gas).

### 6 Experimental Dir. Official Lang. Schools

**1** (A) 1. (✗) 2. (✗)
3. (✓) 4. (✓)

(B) Because they transport water and nutrients to the plant's leaves.

**2** (A) 1. a 2. a 3. c 4. d

(B) House flies (all items are producers, while house flies are insects).

**3** (A) 1. b 2. a 3. d 4. c

(B) It will germinate and grow well.

## Alexandria Governorate

### 7 El Agami Edu. Zone

**1** (A) 1. c 2. c 3. d 4. d

(B) Because they eat primary consumers that eat plants.

**2** (A) 1. (✓) 2. (✗)
3. (✓) 4. (✓)

(B) At first, the eagles would not be affected, but when the consumers die, the eagles would have less food.

**3** (A) 1. photosynthesis
2. salty water
3. reproductive
4. decomposers.

(B) They are producers in the marine ecosystem.

## Menofia Governorate

### 8 Shebeen El-Koum Edu. Zone

**1** (A) 1. light – chemical
2. fungi – decomposers
3. liquid – gas
4. filtration – evaporation

(B) The plant can't produce seeds that help it to reproduce.

**2** (A) 1. b 2. c 3. d 4. a

(B) Because it transports oxygen and nutrients through the blood to all the body parts.

**3** (A) 1. (✗) 2. (✗)
3. (✓) 4. (✗)

(B) primary consumer – tertiary consumer (top predator).

## Dakahlia Governorate

### 9 Science Inspectorate

**1** (A) 1. d 2. c 3. a 4. b

(B) Grass ⟶ Insect ⟶ Frog ⟶ Snake ⟶ Hawk

**2** (A) 1. (✗) 2. (✗)
3. (✓) 4. (✗)

(B) The particles of the solid matter will move, vibrate and spin around faster.

**3** (A) 1. seed dispersal.
2. Decomposers
3. tubers.
4. Microorganisms

(B) By evaporation of water.

## Gharbia Governorate

### 10 Samanoud Edu. Zone

**1** (A) 1. b 2. c 3. d 4. a

(B) 1. Traveling by wind.
2. Floating on water.

**2** (A) 1. (✓) 2. (✗)
3. (✓) 4. (✓)

(B) Because it is a gas matter.

**3** (A) 1. chemical 2. stomata.
3. cold 4. Model

(B) They get rid of algae from their tissues causing coral bleaching.

## Damietta Governorate

### 11 New Damietta Edu. Zone

**1** (A) 1. c 2. b 3. c 4. b

(B) Because they can make their own food through photosynthesis process by absorbing the sunlight through their leaves.

**2** (A) 1. (✗) 2. (✗)
3. (✗) 4. (✓)

(B) The plant can't absorb the energy from sunlight and can't make photosynthesis process.

**3** (A) 1. Measuring tape.
2. Physical changes.
3. Oxygen gas.
4. Decomposers.

(B) birds – they eat grasshoppers that eat grasses.

## Ismailia Governorate

### 12 Science Inspectorate

**1** (A) 1. roots

2. measuring cup.
3. faster.
4. human circulatory

(B) Because chlorophyll absorbs the energy from sunlight that helps the plant to make photosynthesis process.

**2** (A) 1. Volume. 2. Helium.
3. Stomata.
4. Carbon dioxide gas.

(B) They get rid of algae from their tissues causing coral bleaching.

**3** (A) 1. c 2. d 3. a 4. c

(B) Grass → Rat → Snake → Hawk

## Beni Suef Governorate

### 13 Official Lang. Schools Directorate

**1** (A) 1. b 2. c 3. a 4. c

(B) The plant can't make photosynthesis process and it will die.

**2** (A) 1. (✓) 2. (✓)
3. (✓) 4. (✓)

(B) Oxygen (all items are solids, while oxygen is a gas).

**3** (A) 1. chemical 2. evaporation
3. stomata 4. liquid

(B) Carbon dioxide

## Minia Governorate

### 14 Matay Edu. Zone

**1** (A) 1. c 2. a 3. a 4. b

(B) Grass → Rat → Snake → Hawk

**2** (A) 1. (✓) 2. (✗)
3. (✓) 4. (✗)

(B) They get rid of algae from their tissues causing coral bleaching.

**3** (A) 1. floats 2. food web.
3. matter. 4. transparent.

(B) 1. Water vapor.
2. Gas 3. Ice.
4. Solid

## Assiut Governorate

### 15 Science Inspectorate

**1** (A) 1. imbalance
2. particles.
3. 0°C
4. organisms

(B) Decomposer.

**2** (A) 1. (✓) 2. (✗)
3. (✗) 4. (✓)

(B) 1. Traveling by wind.
2. Floating on water.

**3** (A) 1. b 2. c 3. d 4. b

(B) 1. food chain.
2. secondary consumer